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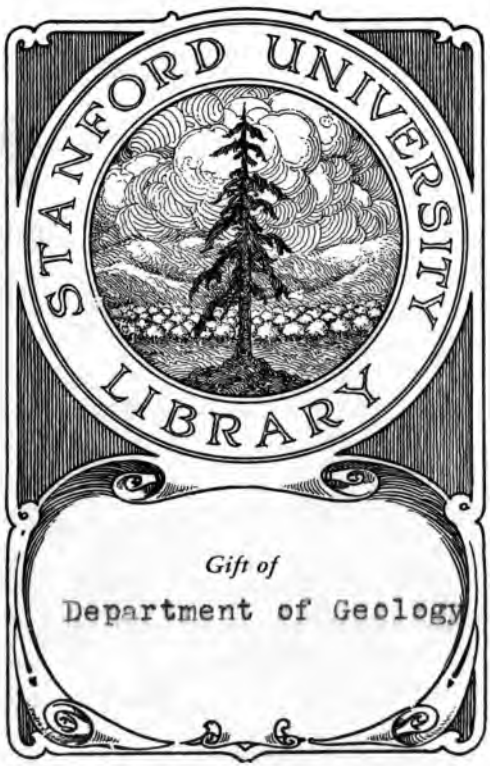
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PRINCIPLES OF SCIENCE

A Scientific Treatise

ON THE

ABSOLUTENESS OF CIRCULAR MOTION AND THE EVOLUTION OF FORCE AS APPLIED TO ALL PHENOMENA.

EMBRACING

A DESCRIPTION OF WORLD-BUILDING BY CONDENSATION OF ORGANIC ELEMENTS FROM WHICH IS UNFOLDED THE TRUE PRINCIPLE OF TERRESTRIAL MAGNETISM (GRAVITY); OF THE EVOLUTION OF CHANGE, BASED ON THE PRINCIPLE OF PLANETARY MOTION; THE TRUE THEORY OF RELATIVE MOTION AS DISTINGUISHED FROM ABSOLUTE MOTION.

DISPROVING THE THEORY THAT THE EARTH WAS ONCE A MOLTEN MASS; THAT THE STRAIGHT LINE IS THE NATURAL PATH OF MOTION; OF PLANETARY ATTRACTION, ETC., ETC.

Designed as an Elementary Lesson in Science for Scientists, and all who Love the Light of Truth.

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MANUAL OF MATHEMATICS

PREFACE

ERE the ushering in of the Twentieth century science will have undergone a grand evolution; or, rather it will have evolved out of the present chaos of vague and indefinite theories a system of evolution, whose prototype is the universe. This little volume betokens the near approach of the scientific millennium. It was thrown upon the crest of time by the evolution of mind, and, therefore, comes not from the genius of the author. If he has rightly interpreted the grand purpose that is the principle and expression of all phenomena, he can claim only the honor of being the chosen prophet. It is but a throb—a wave from the great mind of the universe—a spark struck from the mind of Deity. If his interpretations are true, let it be regarded as a prophecy that is itself the fulfillment of the prophecy of Daniel, whose spiritual vision fell upon the present age, which revealed to him the phenomenal increase of knowledge. If they are false, the prophecy that "in the last days false prophets shall arise," will have one striking

evidence of fulfillment. There is a reason for the existence of all things, and that reason, if understood, discloses the purpose. There is, then, a purpose attending the publication of this treatise, of which the author's may be only a conjecture. To that grand purpose who directs all things and thrills them with the principle of life and intelligence, the author humbly bows, and to Him, whose will that purpose is, he dedicates this feeble attempt at mind reading, realizing that, if he have read aright, it will be assigned a place in the archives of human destiny.

THE AUTHOR.

SAN FRANCISCO, CAL.

" Thus the Seer
With vision clear,
Sees forms appear and disappear,
In the perpetual round of strange,
Mysterious change
From birth to death, from death to birth,
From earth to heaven, from heaven to earth;
Till glimpses more sublime
Of things, unseen before,
Unto his wondering eyes reveal
The universe as an immeasurable wheel
Turning forevermore
In the rapid and rushing river of time."

—*Longfellow.*

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WORLD BUILDING

PLACE a piece of paper over a bar magnet and scatter on it a coat of iron filings. The influence of the magnet will quickly arrange the filings in regular lines called magnetic curves, as shown in Fig. 1. It will be noticed that the aggregation of the curves is a complete magnetic atmosphere, which if filled with a dense medium, would be a miniature globe.*

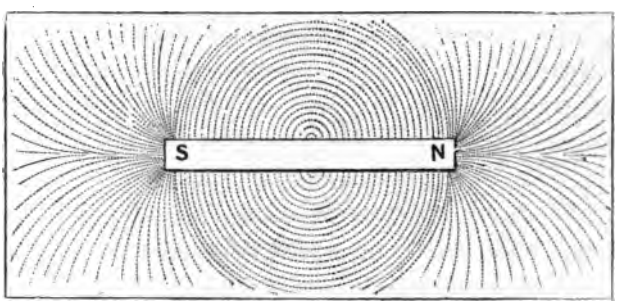

FIG. 1

Now there is no distinction between the "law" of the magnet and that of gravity. Both act from

*It is hardly necessary to remind the reader that all natural forms are globular. From the atoms that form the tiny dewdrop, through all the ever-varying products of nature where the atomic globules have marked the circular outline, to planets and suns, we see the same great principle of world building in ceaseless operation.

center to circumference and by the same rule of increase and decrease of power. We see then that the magnetic operations of both the earth and the bar magnet are not only similar but *identical.* Hence, the foundation of my theory of world-building is laid on known and well-defined conditions. Standing upon this sure foundation, we may readily trace the operation and progress of the earth's growth from a magnetic germ to its full maturity.

Underlying this theory is the principle of Motion. In the Universe we see striking evidences of motion without Force. There is no such thing as absolute rest; therefore there never could have been a beginning of the principle of motion, since a beginning proves an end, and, vice versa, an end proves a beginning. Hence we deduce the self-evident conclusion that *motion is a fixed and ruling principle of the Universe.* Therefore, in an absolute sense, there is no such thing as "a law of motion." It has only a relative signification, relating to *mechanical* and not to *natural* conditions.

According to the same fixed principle, the direction of motion is circular. So far as the human mind has strayed into the field of investigation, it has found every thing (not mechanical) moving in circles. From the elementary forms of existence to the planets and suns, all motion is in perfect harmony with the principle that is as broad as the Universe: *Circular motion is a fixed and ruling principle.*

This brings us to the proposition that, in the

realm of nature, circular motion is Absolute in Authority and Eternal in Duration. Underlying this proposition is an intelligent Purpose, which is, briefly, this: For each planetary system there is a central sun, or source of those elements which, combined with the elements of a planet, produce all the local phenomena common to the respective planet. Obviously, the rotary and circular motions of planets, all in perfect harmony around the central suns, secures the greatest good and highest results, in accord with the most perfect system of economy, that could possibly be attained. All the phenomena of the Universe are embodied in this purpose. Therefore the principle involved in the existence and operation of all phenomena represents this purpose. Now, the principle disclosed by the operations of planetary systems is put forth in the following propositions:

I. Circular motion is Eternal in Duration and Absolute in Authority.

II. Suns are Central Points of the Circles, and the circles are the pathsway of the planets.

III. Suns act upon the planets through the medium of Solar Force, and the varied Phenomena, peculiar to each planet, are the effects.

Let us follow these out in their order:

I. Circular Motion.—Consistent with perfect harmony, the operation of the phenomena that are linked together by the co-operation of suns and planets must also be circular. Gravity, illustrated

by Fig. 1, Heat, Light, Sound, Atomic motion, etc. are vibratory or move in circles. It will be noticed that rotundity or the circular form is given to all the animal and vegetable kingdoms. The human form, all animals, trunks and limbs of trees, fowls and their eggs, etc., are circular in outline.

ETERNAL IN DURATION.—The principle underlying planetary motion and the connecting forms of Force alluded to above is Eternal in duration. Force is perpetually undergoing changes of form, but its nature is as unchanging as the principle which its operations represent, which is planetary motion.

ABSOLUTE IN AUTHORITY.—A fixed principle carries with it its own authority. If Circular motion be a fixed principle, its authority, in the field of its operation, is absolute. For example, the circular currents of magnetism cannot be diverted into straight lines.

II and III. The operations of Force being circular, proves a common center. Force acts from these centers, which proves circular outlines. Our senses are witnesses to the operations of Force since the very impressions made upon them are produced by vibrations radiating from common centers.

With these incidental explanations, which are a portion of my theory of world building, let us resume. Starting out with the proposition that "worlds grow" by a certain process of condensation, we call to our assistance the imagination to picture to us our own earth transformed into a

globular cloud of vastly attenuated vapor with a central magnet, all moving in the same relative order, harmony and position that characterizes it to-day. In short, its orbit and rotary motion have remained unvarying and unchanged. Chemical aggregation and magnetic attraction marked the process and progress of condensation. I define attraction as the aggregation of *the affinity of magneto-electric currents, the center of the magnet being the common center.* The principle of its operation is as follows:

As the square of the distance from the center increases, attraction decreases; and conversely, as the square of the distance decreases, attraction increases.

In the formation of strata the respective distances from the magnet determined their quality, thickness, density, etc. The thickness and density of the first must have been the greatest, gradually decreasing as the square of the distance from the magnet increased. Had there been no such thing as *quality* in the nature of atoms that entered into the earth's make-up, its formation would not have been stratified, but would have been the continuation of the same quality throughout, characterized only by a gradual decrease in density to the outer surface. The formations of strata were regular and systematic, periodically changing in character until the last next in density to ice was formed, then solid ice, which,

after a certain thickness was reached, gradually blended with air until it gave way to the stratum of air that now constitutes the greatest atmospheric altitude.

This was undoubtedly the initial condition of the earth. Forming in space where the temperature is supposed to reach the utmost frigidity, we can conceive of no other means by which water could be formed. Even admitting that the earth was a "molten mass," as is claimed by accepted science, I utterly fail to understand where, and in what condition, the water could have been. Such degree and magnitude of heat would have driven the water from the presence of the earth forever. And without the presence of heat the waters of the earth must have formed into a stratum of ice. At least this is the only reasonable conclusion that could be reached.

In this condition the earth was a magnificent waste—a jewel set in the diadem of eternity. Could she have been viewed from a near approach, the rude grandeur of an undimmed, unbroken waste of ice glittering in the sunlight, would have been a spectacle more sublime and more awful in its profound silence and mystery than pen or tongue can paint, or thought conceive. This marked the first grand period in the evolution of the earth itself—Birth. The periods that shall mark her Growth, Death and Decay are yet to be evolved by change determined by the

evolution of Force.* The first step in the series of evolutions of growth must be taken. Accordingly, the fires that shall melt the ice and penetrate far down into the depths of solid strata are enkindled by solar forces. The thunder of the earthquake in the wake of these forces, rolls along the dismal and awful corridors, across whose dark and yawning depths ten thousand electric currents meet and ignite, melting rock and metal like wax or reducing them to volcanic ashes, to be upheaved to earth's reeking bosom or cast against the blackened sky. The crustacean of ice was shattered, and in melting away formed vast oceans of floating, surging glaciers. For centuries, it may be, the subterranean storms still raged, and to add to the awful picture, the storm-clouds that were quickened into life by the evaporation of the heated waters, poured forth cascades of rain. The raging billows rolled in the sweep of the tornado while the lurid lightnings, dazzling the very heavens, seemed to mock the volcano's tame though raging flames. The infant earth trembled beneath the storms of fate that raged as if it were the work of some furious demon.

At length when all the changes had been wrought that were possible for this period, the fires were extinguished and the earth again put

*See page 39.

on her shroud of ice and sank back into the repose of a glacial era. Thus closed the

LAURENTIAN PERIOD

According to geology this period brought forth the first ray of life that ever appeared in the world. The name given to this little creature is Eozoon (Dawn—Animal), and its remains are all that have yet been found to tell that life in any form was introduced on earth during the Laurentian Period.

Beginning with this period I will give the geological record as formulated by high authorities, supplemented by occasional remarks:

CAMBRIAN PERIOD

In the lower deposits of this period, evidences of life are few, being principally marine plants and worms. Towards the close, however, a greater number and variety appear. There are evidences of tremendous upheavals and volcanic eruptions in many places, throwing up molten matter and ashes, which were washed in strata called the *Cambrian Rocks*, and are supposed to be 5,000 feet thick. On the muddy bottom of the Cambrian seas swarmed innumerable crustaceans, the Trilobite being the most notable. Over 400 species of this little animal have been discovered. Of other animals, there were 6 species of corals, 4 of star fishes, 29 of worms, 12 of bivalves, 172 of univalves,

190 molluscoids, 65 nautili and cuttlefish, 27 species of sponges, and 25 of marine plants. An interesting discovery is that of rain marks and shrinkage cracks on the rocks, which are in perfect preservation. This is an evidence of the action of the sun, of the tides and of rain in that period just as we have to-day.

SILURIAN PERIOD

The length of this period is supposed to have embraced uncounted ages, as the deposits on its ocean beds amount to a thickness of more than a mile and a half, composed in greater part of animal remains. During this period many disturbances and extensive volcanic outbursts took place, laying the foundations for numerous groups of islands. At the same time myriads of the busy little polyps were equally efficient in building up other islands, and even extensive reefs that were destined to form the continents of after ages. At that time, it is supposed, the present site of America was a vast coral sea.

Toward the close of this period the conditions became so advanced as to admit of the introduction of an entirely new species, the *vertebrates*, or animals having backbones. They resembled the shark in many respects, differing in this that they had cartilaginous frames instead of bones. No remains of air-breathing animals have yet been discovered.

About 9,000 different species have been found in the Silurian formations, of which less than

1,000 belonged to the preceding period. In this connection I will just add that this was owing to the change of the condition upon which the different forms of life depend. The change of the conditions from the Cambrian period to the Silurian were such as to preclude the reproduction of the greater part of the species of the former, yet not so great as to not permit of the reproduction of some of the more advanced.

DEVONIAN PERIOD

Many great changes of land, water and climate were wrought by this period. This was caused by terrific earthquake and volcanic disturbances, which lifted ocean beds up into dry land. These remarkable disturbances occurred at the introduction of this period, which shows a strong *distinctive* feature. This proves an evident outline of the periods which, if it could be clearly traced would reveal their *exact number*, and what would be of greater scientific significance, the intervention of glacial periods that marked the outline of each and all.

Of the general appearance of the world at this period, one authority gives the following vivid picture: "Had we lived in that age, we should not have seen great continents like those that now exist, but we could have roamed over lovely islands with breezy hills and dense lowland jungles, and we could have sailed over blue coral seas, glowing below with all the fanciful forms and brillant colors

of polyp life, and filled with active and beautiful fishes. Especially did all these conditions culminate in the Middle Devonian, when what are now the continental areas of the northern hemisphere must have much resembled the present insular and oceanic regions of the South Pacific. Many species of corals had now carried their elegant works to their highest perfection."

The decline of this little Trilobite in form and numbers is a marked feature of this period. It proves that their mission of island building is about at an end, and hence the conditions upon which life depend are correspondingly changing. This period was marked by the introduction of new species of fishes that are in no way connected with any that lived before. Some resembled the modern shark. One, the Dinicthys, had a head more than three feet long and half the length in width, with huge bones of tremendous strength. A stronger assemblage of forms, shown by the remains of this period, have rarely been grouped together; creatures whose very type is lost. In form so uncouth and fantastic, the naturalist is puzzled to assign them even their class.

Land plants spring up plentifully in this period. Toward the close new and peculiar kinds of vegetation spring up over marshy swamps. There were dense forests, that were yet absolute solitudes, growing inland. There were yet no land animals to break their awful silence.

CARBONIFEROUS PERIOD

All along through the periods the earth had been steadily advancing, improving in soil, climate and all the conditions necessary to the introduction and sustenance of higher forms of life. During this period there were marked changes in all these respects. The great coral seas, were raised by disturbances into swampy flats, and marshy regions were raised into uplands, checkered with lakes and streams. On these, later on, grew dark and tangled forests. A picture of these is thus drawn from the imagination. "We are in the midst of one of those low plains formed by the elevation of the former sea-bed. The sun pours down its fervent rays upon us, and the atmosphere, being loaded with vapor, and probably more rich in carbonic acid than that of the present world, the heat is as it were accumulated and kept near the surface, producing a close and stifling atmosphere like that of a tropical swamp. This damp and oppressive air is, however, most favorable to the growth of the strange and grotesque trees which tower over our heads, and to the millions of delicate ferns and club-mosses which carpet the ground. Around us for hundreds of miles spreads a dense and monotonous forest, with here and there open spaces occupied by ponds and sluggish streams, whose edges are bordered with immense savannahs of reed-like plants, springing from the wet and boggy soil. Everything bespeaks a rank exuberance of vegetable growth; and if we were to dig

downward into the soil, we should find a thick bed of vegetable mould evidencing the prevalence of such conditions for long ages."

There is nothing of this day can present to us an adequate conception of the immensity and magnificence of the vegetable growth of this period. The conditions essential to the creation of these great forests existed first, but the evident *purpose* of the creation of the conditions threaded through the grand system of progress that characterized the earth's development from the beginning to the time when it culminated in the "creation of man." And now looking back over the chain of events that marked the periods he sees them all contributing to the sum of conditions which characterize the present age. All that man is or may be, in his natural state, is the end of the grand purpose of all the periods. All living creatures and things, and all the ever varying changes wrought by disturbances contributed to the conditions most suitable for his maintenance, and the splendid civilization which he has molded out of those conditions. He is the offspring of a purpose and not of a bare necessity. These dense and tangled forests were swept down by tornadoes and floods, to be succeeded by other growths of forests, which were in turn, swept down and covered, and continuing the process for vast ages, until the whole was overlaid with the strata of subsequent periods. And now man takes from nature's great storehouse the useful, and, in some

countries almost indispensable fuel, *coal.* The great vegetable deposits were converted into coal by nature's own process, yet we see the end of the purpose, for which it was created, *in its use.*

A few inferior species of land animals began to make their appearance during the early part of this period, but later on a few of a higher order sprang into existence. This period marks the introduction, for the first time on earth, of air-breathing animals.

PERMIAN PERIOD

Geology tells us that this period witnessed many stupendous disturbances, which developed new changes of climate, land and water, and consequently, natural productions. Volcanic heat was so intense in many places as to crystallize rocks, fitting them for future uses of art. By the same heat stored their crevices and fissures with mineral wealth such as copper, tin, topaz, emerald and sapphire. Also much of our gold comes from rocks that were stored with it at this time.

We learn from geology that a very general extinction of former life marked this period. Animal and plant productions were inferior to those of the preceding period. The turbulency of electric disturbances which was so general and continuous, was evidently the cause. The accumulations of its deposits amount to from 9,000 to 12,000 feet in thickness!

TRIASSIC PERIOD

This period was marked by periodical outbursts of disturbances. Among the formations of this era were beds of gypsum, limestone, and rock-salt. The thickness of these beds with intervening layers of clay aggregate 5,000 feet. These salt-beds are supposed to be formed from the evaporation of sea-water from basins that were repeatedly filled from the ocean by repeated agitations caused by earthquake disturbances.

The animal and vegetable growth of this period were of a higher order than that of the preceding. Many animals of formidable dimensions were the product of this age.

JURASSIC PERIOD

We are informed that this period presents the most interesting chapter in geological history. The proportion of land was more extensive than it is at the present time. There were not less than 4,000 species of animals introduced, many of them of gigantic size. Animal life swarmed on land and sea, while vegetable growth was dense and exuberant. The changes though remarkable, were brought about more gently. Continents that had been builded upon coral reefs sunk by the force of gravity. Others were raised above the water by earthquake forces. These changes were all gradual, covering a period of time beyond reckoning. Volcanic disturbances were less frequent and severe however, which

tells that the work of the agencies by which all change is wrought has become more diversified, calling them away from the narrow field of their former depredations. And so these agencies of progress went quietly on in their round of activity, producing and reproducing in almost endless number and variety, until the series of changes were exhausted for this period. The Jurassic period may not have terminated at the point given by geologists, but at whatever point of time or progress, its end was the beginning of a glacial era.

CRETACEOUS PERIOD

The physical changes of this period were similar to those of the preceding. Continents would raise and sink during the process of uncounted ages. The changes in the aggregate were very great, however, which produced corresponding changes among organic existence. Few of the plants and animals of the Jurassic period were reproduced in this, but vast numbers of new species and genera were ushered into life. Animals of prodigious size, birds, reptiles and insects of peculiar forms densely populated the earth. The internal electric fires though less active in each succeeding period, still quickened the earth into life and activity. In that *life* and *activity* were bound the forces that had once raised whole ranges of mountains and set ten thousand fierce volcanic fires in their depths.

In the Arctic regions as far as man has explored he finds evidences of a once tropical climate. This tells that the forces that once conspired to warm the soil and seas of those regions have been called to new fields of labor.

The vegetation of this period was not so remarkable. There were, however, new forms strongly resembling the present willow, alder, maple and walnut, which shows a decided advancement in quality.

The most remarkable fact connected with this period is the complete extermination of all animal species on land and sea. The inhabitants of the former period are all missing. "With the great cretaceous subsidence the curtain fell upon the age of reptiles; and when it rose again, after the vast interval occupied in the deposition of the green sand and chalk, the scene was entirely changed. There were new mountains and new plains, forests of different type, and animals such as no previous age had seen." It is evident that "the curtain that fell" was a glacial era. I take the evidence as a striking proof of that theory.

TERTIARY PERIOD

Great changes in land and sea were recorded by this period, but not so general or extensive as those of earlier times. There was a marked submergence of lands at the beginning of this age, followed by the elevation of other extensive regions. Mountain ranges were uplifted by the forces of the earth-

quake. It is evident that great activity of forces prevailed at the opening of this period. This is strong corroborative evidence that at the dawn of the Tertiary the earth awoke from the slumbers of a Glacial period. Opening, as at the beginning, the electric forces found a blank and tenantless globe. As at the first, their pent-up energy found vent in their old subterranean field. In their fury they raised continents and whole mountain ranges, and started smouldering volcanic fires in the embers of the once deserted craters. Earth was again warmed and quickened into new life and activity. The splendid specimens of animal and vegetable remains that belong to the close of this epoch show that comparative quiet reigned at that time. The advancement made in the character of animal and vegetable growth is a no less distinguishing feature than their diversity of species. The earth was literally tropical in aspect. No previous period can claim such wealth and extent of productions as those which belonged to the close of the Tertiary.

POST-TERTIARY

It seems that the close of the preceding period and the opening of this are not divided by any sudden or great change, either physically or in the character of organic life. The following picture of the animal population of the British Isles in this era is given by eminent authorities:

"Gigantic elephants, of nearly twice the bulk of the largest individuals that now exist in Ceylon and

Africa, roamed here in *herds*, if we may judge from the abundance of their remains. Two-horned rhinoceroses of at least two species forced their way through the ancient forests or wallowed in the swamps. The lakes and rivers were tenanted by hippopotamuses as bulky and with as formidable tusks as those of Africa. Three kinds of wild oxen, two of which were of colossal strength, and one of these maned and villous, like the bonassus, found subsistence in the plains. There were also deer of gigantic dimensions, wild horses and boars, a wild-cat, lynx, leopard, a tiger larger than that of the bengal, and another carnivore as large, which, from the great length and sharpness of its sabre-shaped canines, some times eight inches long, was probably the most ferocious and destructive of its peculiarly carnivorous family. Besides these, troops of hyenas larger than the fierce *hyæna crocuta* of South Africa, which they most resembled, crunched the bones of the carcasses relinquished by the nobler beasts of prey, and doubtless often themselves waged a war of extermination on the feebler quadrupeds. There were also in Britain at this time a savage bear, larger than the grizzly bear of the Rocky Mountains, wolves, and various smaller animals, down to bats, moles, rats and mice."

Similar classes of animals were numerous in all the countries of Europe and Asia, and many of the same in North America.

The vegetation was equally splendid in proportions and abounding in varieties. The imagination

cannot paint a picture so magnificent in the luxuriance and beauty of vegetable growth, tenanted by myriads of the noblest forms of animal life, as the world presented at this geological date. We must be content to view it in fancy as a tropical scene, such as is now confined to the equatorial belt.

FIG. 2

GLACIAL PERIOD

But suddenly we are confronted with the account of the "*Glacial period*," the evidences of which are undoubted. We are told that, for some unaccountable reason, the whole earth became locked in polar snows and ice, remaining for ages a bleak and barren waste of ice-fields studded with gigantic icebergs. We are informed that on both hemis-

pheres ice formed to the depth of over 5,000 feet, and that not a vestige of life survived to populate the earth at the opening of the present age. If the causes which developed such a radical change from a tropical climate to one of the fiercest frigidity are unknown, what shall we say of the return of warmth which swept away such vast accumulations of ice, and evolved out of chaos the most perfect specimens of animal and vegetable life? How can we harmonize the theory that the tropical productions of the earth at the beginning of the Glacial period were due, in greater part, to warmth generated by the internal heat of the earth, with the *fact* of a glacial era, and that to be followed by a return of the earth to magnificent fruitfulness and "Italian skies"? I mean no uncharitable thrust at accepted science when I ask, what became of the molten, seething mass of rock and metal that had just warmed the earth into her wealth of productions, when her surface was buried thousands of feet under a solid crust of ice? The internal heat could not have been quenched, else the ice that had been centuries in forming would have defied the Summer sun of the ages that have intervened to the present time. In the natural order of things, the liquid heat of the interior of the earth, produced by no immediate or connecting cause, must obey the laws of heat as long as the source of heat remains. But it seems that the heat returned after the lapse of ages (through which it must have been dormant), and blessed the earth

more abundantly than ever before. The crowning work of all the periods came forth from the hands of the Supreme Architect, "a living soul." Here MAN, in all his primitive wealth of mind and body, first beheld the light of day on earth as he looked out from the garden of Eden upon scenery unrivalled by the tropics of to-day. The earth had evidently lost none of her original warmth, and yet she had just emerged from her icy sepulcher, where she had been buried for untold ages!

I can imagine the cessation of the electric storms, which I have described as causing earthquakes, volcanoes and other disturbances, besides generating the internal heat; and I can conceive of how the earth might pass through a glacial period as a result. I can also see some sound philosophy, answering to an intelligent purpose, in returning the potent agencies of heat to break loose the great crustaceans of ice and ice-bergs that had formed, and with the raging winds, dash them against the uplifted rocks, grinding them into powdered soil or leveling them down to valleys and undulating plains. But I fail to understand what "law" of force or principle of sound mathematical calculation would explain the phenomenon of a Glacial period intervening two of tropical warmth, assuming that that warmth was produced, in greater part, by the earth's internal heat, generated by the native, active agency of molten matter.

Since the foundations of the earth were laid in a molten globe, the "cooling off process" has been

gradual, yet in the very glory and splendor of its warmth—robing the earth in perennial green and quickening into being the noblest forms of animal life—we are confronted with the unaccountable phenomenon of a change to a condition more severe than arctic Winter, to be followed by a return to ethereal mildness and beauty! We are taught that now the heat of the sun on the earth reaches a depth of one hundred feet, where it is met by the internal heat. Then, just preceding and following the Glacial period, the internal heat evidently mingled with the solar heat, else the flora and fauna would not have reached a degree of perfection so much in advance of those of this age. This evident decline, since the creation of man, is a striking proof of the gradual "cooling off process" through which, it is claimed, the earth has been passing since the beginning. The Glacial period breaks the chain of the theory, however, and we are left to weld it together by conjecture.

In this treatise I have endeavored to establish a strictly philosophical theory, that threads through the phenomena with which I have dealt, which, if followed out and tested, will be found more consistent and reasonable than that which endeavors to conform the principles of nature and of the universe to preconceived opinions, that are unconsciously prejudiced and warped by early impressions that are always at variance with the deductions of abstract reasoning.

The earth has unquestionably passed through

those stages or periods of development recorded by geology and which I have briefly summarized here. The discoveries of animal and vegetable remains, much of them petrified, forming layer after layer of rock, each answering to the species of which it was formed, and in turn, representing the periods into which they have been classified, serves as a most conclusive proof that in the main, the geological history of the earth is correct. High authorities differ as to the number of periods through which the earth has passed, but all agree as to the gradual and revolutionary process of the earth's development. According to the same high authorities two periods terminated with the total extinction of life, followed by the introduction of new species and genera at the opening of the next succeeding. The outline of the others is still veiled in uncertainty, although it is quite evident that a Glacial period alternated with each and all. We are thoroughly satisfied of one, and of the other we can have little doubt. There is not a lack of evidence that others preceded these, though it is hardly probable that there were really more than four or five periods.

It is argued, however, that there was in fact, but one Glacial period, and that, though life became extinct at the close of one preceding, it could not have been produced by such an unaccountable cause. That these were the only points of time in geological history when life became extinct, the flimsy theory is offered that the remains of

species that belonged to one period were found in the next, and so on, showing a *gradual* decline of the lower orders and progress of the higher orders. We can see no convincing evidence that the species of one period that belonged to one preceding were not *reproduced*. Indeed, it is of geological record that the Linguelae, a little creature of the Cambrian period, has survived the lapse of all the periods and the ages since to the present day. Its extermination must have been complete during the Glacial period, since it is clear that propagation of species was impossible during that era. So with the apparent survival of other species from one period to another; they were evidently reproduced, and not evolved in succession from lower to higher orders.

But let us pass on to the discussion of the question as it stands. Disturbances arising from the pent-up fires of the earth's interior might and doubtless would, be of sufficient force to break up the crustacean of earth that is said to have first formed. Yet, when once broken, the tens of thousands of yawning crevices and belching craters would forever after act as safety valves. Through these, the accumulating gases and heat would find vent, and even though the openings of some would become obstructed, the formation of a few more would ease the pressure from within. It is apparent that no general disturbances could occur after the first; and certainly nothing spasmodic or periodical could result from such a regular and continuously operating cause.

The theory, then, that the phenomena of internal heat, volcanic, earthquake and other disturbances that combined to produce all the varied changes and stages of development from the beginning, are the direct effects of electric forces, may be philosophically entertained. Especially so when measured and periodical revolutions are discovered to be the legitimate effects. It is apparent that a mechanical cause could not, in obedience to any known principle, deviate from a regular and continuous operation. For example, let us suppose that a vessel containing water was placed over a fire, or any mechanical agency of heat, that could not vary from a perfectly uniform standard, could we expect that the effect of the heat on the water, as might be demonstrated by the quantity and power of the steam generated, would vary from that standard? Would we expect that ice placed upon the surface of the vessel would not melt so long as the heat penetrated and warmed the surface? And should the heat decrease, according to any fixed principle, to a point where the ice would remain, do we suppose that the ice would ever melt and the surface of the vessel resume its former temperature without the return of heat? And don't we know that the temporary suspension and return of heat would be impossible if the operations of that which produced it were fixed by immutable principles. And this is analogous to the theory of the molten condition of the earth

at the beginning and its "gradual cooling off process," as taught by science of to-day!

Everywhere we see the earth endeavoring to enforce and maintain an equilibrium. There are perpetual rounds of tearing down and building up. The earth refuses to part with one atom of her composition, but the chemical action of the sun tears from her firm hold of cohesion portions of her body, converts it into the living principle of animal and plant, or, it may be, a flash of lightning from the clouds. The animal and vegetable kingdoms and the flash of lightning represent so much of the earth's body as set free against her will, combined with the sun's chemical forces. The earth claims her own, and would tear down every living organism or active force to secure it. From the beginning this is true. Then, the sun flashing his chemical rays upon an ice-bound world, started from their slumbers floods of atoms and put them in motion. Deeper and deeper, as the ages rolled, he plunged his dissecting rays, tearing from the congealed embrace of cohesion the willing waters. In time the underlying strata gave way to the mad fury of the pent-up forces of earth and sun. Great electric storms went crashing through the outer crustacean and on into the depths of earth, leaving along its myriad paths the desolation of the earthquake and countless electric sparks. Spanning chasms down deep in the shattered strata, the electric fires began to burn, melting and fusing

rock and metal, increasing in intensity as the volume increased, until the expanding vapors, heat and lava forced an opening to the surface. Thus is the "molten matter" formed, and it will never become extinct, while the conditions are favorable to such electric action, until an evolution of the active forms of force is completed.

Thus the earthquake and the volcano are the effects of underground electric storms!

EVOLUTION OF FORCE

THE period marked by the first revolution of disturbances represents an evolution in all the active forms of Force involved. When they completed their circuit of changes they ceased to act, and remained at rest until again revived by the chemical action of the sun. This latent state of the forces evidently represents a glacial era or a relapse of the earth into its primitive condition. The length of this latent or dormant period was perhaps, the same in duration as that consumed by the evolution which preceded it, and, conversely, the length of the period marked by the evolution was equal in duration to the following glacial era.

From these premises it is evident that the early progress of the earth was marked by *distinct periods*. At the end of each life became extinct, to be followed by the introduction of new species and genera, and the reproduction of "the fittest" of the preceding period. Indeed, the solid foundations are laid for such a conclusion. It has been clearly proven that *the Glacial era* intervened the period of Man (the present) and the one preceding it. There was an immediate and overruling cause that developed such

a contradictory condition of a frozen world from one of tropical warmth which immediately preceded and followed it. Was it simply the relapse of earth into its primitive condition? Does geological history repeat itself? From the accepted theory of science, No. From the principles of force as read from the book of Nature, Yes.

We trace the footprints of evolution far into the physical, intellectual, moral and spiritual universe. Into the physical the principle of evolution has been traced, and while but comparatively little of the field has been explored, yet enough has been discovered to establish the principle. The intellectual, moral and spiritual which include the social, political, etc., bear the unmistakable imprint of evolution. Change marks the circle of evolution. In vain do scientific explorers follow the trackless round. No sooner do they start in their swing around the circle than they "fly off in a tangent" and are precipitated into "a straight line" of absurdities.

But let us come to the point of our explanation. The solar forces unite with certain elements of the earth and carry them around in a certain fixed system of change evolving all the phenomena of Birth, Growth, Death and Decay.

Fig. 3 represents the basilar principle of my theory of Evolution.* The minor evolutions of

*It is hardly necessary to remind the reader, who has given the principle of the science of all sciences—*Chemistry*—any attention, that it is impossible to literally illustrate, by any formula, the course of Change. It is as continuous as the motions of the earth,

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Time are illustrated by the small circles (365 in number), representing the days and nights, and corresponding to the rotary motion of the earth. The aggregation of these minor evolutions describe the earth's orbit, or the greater evolution of Time, the imaginary point of beginning being marked by the word *Evolution*. This greater circle is divided into four arcs corresponding to the four seasons—Winter, Spring, Summer and Autumn. Corresponding to these are Decay, Birth, Growth and Death. Here, then, we have an illustration of the natural divisions of Time, which describe the course of Change; all combining to form the great principle and system of Evolution. This principle and system must conform to the motions of the earth, since these evolve the divisions of Time, which, in turn,

by which it is regulated. It may be said that decay, birth, growth and death are constant companions. Decay (decomposition) is the beginning and end of all life and activity. Birth follows it in the order of progression, and Death precedes it in the order of decline. The process and products are the same in all the phenomena of change. *Beginning* and *end* are relative terms, having reference to things, and not to a principle. Absolutely there is no beginning nor end of Change. But as applied to things individually, we may say that the beginning is the end, and the end is the beginning. From a given point, the earth revolves around the sun, returning in 365 days. This is a grand evolution of Time, evolving in its round the evolutions of the four seasons, and the minor or daily evolutions. Accompanying, and corresponding to, these evolutions of Time (and not less continuous), are the evolutions of Change. There is no beginning of Time, as measured by motion, and there is no beginning of Change as measured by Time. Hence it will be seen that no drawing or mechanical contrivance could be formed that would literally illustrate the system of Evolution as outlined by Fig. 3.

mark the course and progress of Change. Now let us note the Correspondence. One half of each minor evolution represents day; the other half night. Night is a state or condition of repose, which corresponds to "Winter" and "Decay," as represented in the arc of the greater evolution. Now, Change is evolved by the operations of the active forms of Force, which, when they have completed an evolution, sink back into a state of repose, corresponding to Night, Winter, and Decay, and is termed a *Glacial era.* Correspondence threads through Night, Winter, Decay and Glacial era, which proves that in a scientific sense, these terms are synonymous. Let us trace the Correspondence a step further. A line drawn through each minor evolution at right angles with the line representing the division of day and night will intersect at each end points representing midday and midnight, the dividing line of day and night intersecting at points representing sunrise and sunset. Two lines drawn across the greater evolution at right angles, crossing each other at the point representing the sun, will intersect at the ends, points representing the middle of Winter, Summer, Autumn and Spring, which are also central points of Decay, Birth, Growth and Death. This not only represents the Correspondence through the Annual, but through the Grand Period or Evolution also. Now we may trace the Blending of Day into Night; of Summer into Winter; of Growth into Decay—threading through a period of the earth's development, gradually blending into a

Glacial era. This is verified by the geological record of the evidences of the gradual approach of the "Glacial Period." The succession, Correspondence and Blending of Day and Night; Summer and Winter; Growth and Decay; the Periods of the earth's development and the Glacial era perfectly correspond.

Carried one step further and we have the Grand Evolution of the earth itself. There are a given number of Days and Nights; Summers and Winters, and Growths and Decays in an annual, or greater evolution, and in a given proportion, so many greater evolutions in a Period of the earth's development, and a Glacial era; and finally, so many of these in a Grand Evolution—"the beginning and end of earth." This conforms to the grand system that threads through the universe. The elements which now compose the earth might, and doubtless had, gone through a complete series of Periods, and was dissolved into its primary elements, from which were evolved the earth—a new and advanced creation from the aggregation of the highest development reached by its predecessor. And now it is well along in another series of Periods—undoubtedly in the last arc of the grand circle of Evolution,—which will doubtless terminate according to inspired prophecy, which declares that "the elements shall melt with fervent heat, the earth also, and the works that are therein shall be burned up." Adding the promise of "a new earth, wherein dwelleth righteousness." The

present Grand Evolution of the earth has witnessed the gradual development of conditions, from which have been evolved a corresponding development of species, culminating in Man—in whose essence is embodied mental and spiritual possibilities that link with that Intelligent Purpose that threads through, and comprehends, all things. He is the advance line of march of this Grand Evolution. What constituted the advance guard of the next preceding, we know not; but enough is known of the principle of Evolution to establish the fact that *man is a new creation.* Conditions evolve species, and *new conditions, new species.* The blending of species does not argue the evolution of species. That Blending, like Correspondence, which I have just traced out, is but the *euphony* of Evolution.* There is the blending of

* This euphony of evolution is a principle of universal application. It is as strongly marked in the realm of Mind as in the physical universe. There is a Correspondence and Blending of the elementary principles of the human mind, beginning with the physical (animal) and ending with the spiritual. The physical, intellectual, moral and spiritual seem to be inseparably interwoven—one overlapping and encroaching upon the other—the blending between one and all being so perfect and uniform that the exact points of distinction cannot be detected. In the physical, the blending of the five senses; of the tastes, appetites, passions, propensities, etc., is strongly marked. In the intellectual, calculation, the perceptive powers and reasoning faculties mutually and imperceptibly blend. In the moral, who can determine the dividing line between excess and moderation, vice and virtue, intemperance and temperance, error and truth? "Natural law in the spiritual world" indicates that what, in this sense, is true of the physical, intellectual and moral is true of the spiritual. Who

the strata of all natural formations, and a corresponding blending of the forms of Force which developed them. There is a blending of all species, corresponding to the blending of strata and the different forms of Force. Examples: The blending of the earth's strata; the blending of Sound (music), Heat, Light (colors), Magnetism, Electricity; the blending of Species—all corresponding perfectly in type. Strata are not evolved *from* strata, nor forms of Force *from* other forms (as Light *from* Heat, one color *from* another, one sound *from* another, etc.); neither species *from* species. There is a *Correspondence* and *Blending* threading through strata, the forms of Force and species, and these are mutually typical, and, in turn, typical of the grand system of Evolution. (See Fig. 3.) It is, therefore, apparent that the seeming evolution *in the line* of species is due entirely to Correspondence and Blending, which keep step with advancement in the development of conditions, from which all Change is evolved. From the beginning new conditions evolved new species. There is no working-over process in Nature by which a monkey might, or could, be evolved into

will undertake to prove that, therefore, all the elements and faculties of the human mind were evolved from some single faculty or instinct? Who will stake his reputation for ordinary sanity by assuming that the universal principle of Correspondence (or typical relationship) and Blending really implies a principle of evolution which, traced to its logical results, would declare the universe to have evolved from a single element, and that element from—well say a unit of nothingness!

a being who "was made in the image and likeness of God." *Man is man* since his introduction on earth. Anything not a man is something else. There may be strong marks of Correspondence and Blending, yet so long as the essential qualities of Man are absent, the *actual dissimilarity* is as complete as if there were not a point of outward resemblance. Correspondence and Blending may be traced through the Primary Colors, yet there is no method by which Red light may be made to reflect Orange, or Blue light, Green. There is no process of mixing, transforming or transposing the Primary Colors as thrown upon the Solar Spectrum.*

It appears, therefore, that certain species were evolved from certain corresponding conditions. I have no argument to make on the precise method

*The rainbow is a beautiful type of the principle of Organic Arrangement, Form and Motion of the universe. Its circular outline is typical of all natural formations and of the natural path of motion. Its Organic Arrangement is the type of the order and system of the universe. Besides portraying the arrangement and blending of Strata, Force, Species, etc., referred to, it is also a striking and exact illustration of the fractional blending of whole numbers. The fractional blending from 1 to 2, from 2 to 3, from 3 to 4, etc., is infinitesimally progressive, like the progress of Time and Change, yet nowhere is there a break in the absolute harmony of all phenomena. Although there are intermediate links or blending between distinct forms, yet those forms must remain distinct so long as they exist. We may trace the mathematical formula from 1 to 2, yet 1 and 2 remain as before, and must forever remain, distinct forms of number. In other words, 2 are not evolved from 1; neither is Indigo evolved from Violet, *nor one species from another.*

by which Man was created or brought forth from the "dust of the earth." * It is enough to know that he is *not an animal* in the sense in which the term is applied to all other animate beings on earth. His destiny is inseparably linked with futurity, and when "the elements shall have been dissolved with fervent heat, and 'a new earth' shall have been evolved from those elements, he (the Redeemed) will come forth the celestialized inhabitant of a 'new earth' purified by fire."

Here my investigation ends. The principle of Evolution is as endless as the figure which represents it—the circle. The Purpose which this principle represents is *progression*, and this, in turn, must be as endless as the principle and Purpose.

Let us resume: Looking back through all the Periods, we see the earth taking her first step in

*I use the word "create" and "creation" in the sense in which it is used in the Bible, and not as defined by Webster. Genesis i: xxvi says: "And God said, let us make man in our own image, after our own likeness." The next verse reads: "So God *created* man in his own image, in the image of God *created* he him." The seventh verse of the second chapter (Genesis) reads: "And the Lord God *formed man of the dust of the ground*, and breathed into his nostrils the breath of life; and man became a living soul." The words *create* and *created* are used frequently through the first and second chapters of Genesis, as *general statements;* but in the last quotation above, it will be noticed that a *statement of fact* is made. In the general statement it reads: "So God created man in his own image." In the *statement of fact* it reads: "And the Lord God *formed man of the dust of the ground*," which defines the word *create* as *organizing* or *forming* something *from something already existing*. This, at least, is the Bible definition, and one that is altogether the most reasonable and sensible.

the series of advancement. Then she had her swaddling-cloth of ice about her, hence the introduction of life was impossible. The field for the operation of active Force was limited to the earth itself, hence the unparalleled disturbances that marked the first Period. Yet the same round was pursued as that which characterized subsequent Periods, only differing in the diversity of changes. Chemical action (Decay) gave rise to the disturbances; then Growth (development of volume and intensity); then Death (decline), gradually terminating in the subsidence (or Decay) of the Forces. Uncounted ages were consumed in the development of these changes, but at the last Death set his seal upon the evolution of this Period and earth sank back into a state of repose (Decay). The last change had been wrought that was possible; the active Forces* subsided at the decree of

*The active Forces referred to here were the elements of the disturbances. There were a given number of those elements, and the duration of their operation depended upon the number of possible changes. On the principle that there is a limit to the number of possible changes in the use of the Six Simple Mechanical Powers in the construction of machinery, to the number of colors that might be evolved from the artificial mixture of the Primary Colors, to the number of intonations from the eight primary musical notes, etc., there is a limit also to the number of possible changes the creative elements could evolve in all their varied operations. That limit marks an evolution in the operations of active Force. There is a diversity of operations of Force and a variety of results. "Variety" is said to be "the order of Nature," but if not understood as the product of a perfect system it would seem to be the *disorder* rather than order of Nature. The principle of diversity is linked with the great system of Evo-

Omnipotent Principle; the fires that had burst upon the earth with volcanic fury died out; the mutterings of the earthquake were hushed—and the pall of Arctic Winter fell in silent gloom upon a frozen world. All the sun's chemical forces for that Period had been unwound from the wheel of Evolution. The principle must be reversed. The wheel must again wind up what it has unwound. Solar forces must again be stored for another evolution of life and activity, while the earth sinks into the long repose of a Glacial era.

Each succeeding Period represents the same evolution of Change, differing in the Diversity of the operations of creative Forces, and it may be in duration. Coming down to the present day, it is impossible to determine what arc of the circle of Periodical evolution we are in, or how it will terminate. According to the best interpretation of

lution, and its operations thread through all phenomena, manifesting itself in what seems to be endless varieties. In the succeeding Periods from the first there was a gradual and uniform progression in the development of conditions, and a corresponding increase in the diversity of the operations of active Force, with attending increase of varieties. Whether this principle of increase would affect the duration of the Periods—i. e., lengthen or shorten them—I am not prepared to say. But this much is certain: The disturbances that marked the history of the Laurentian Period diminished in volume and intensity during the succeeding Periods in exact proportion to the development of conditions which determined the *diversity* of the operations of creative Forces. The more general the diffusion of the *volume* of those Forces, the nearer their operations approach an equilibrium.

inspired prophecy, however, we are now in the last arc, and that at the termination "the earth will be purified by fire." That it may have an opposite termination from those of preceding Periods is not at all unreasonable, since there is comparatively little in this Period that we can compare with the conditions of any one of the past. Steam, mechanical heat and friction, the vast mechanical productions of electricity, etc., are all peculiar to this Period. The entire habitable globe is now a grand workshop run by Forces mechanically produced, which in turn produces enough frictional electricity to illuminate the world. Just what effect this may have in shaping the destiny of this Period no one knows, but it is not at all absurd to suppose that the effect will be in the direction indicated by the character of these new creations. They continually add to the volume of active forces, and the cyclone may only be the initial step to "earthquakes in divers places," and other great disturbances foreshadowed by inspired prophecy, terminating in its fulfillment: "The earth and the works that are therein shall be burned up."

REVIEW

WITH reference to my theory, that the central germ of the earth is a magnet, I quote the following corroborative testimony: "The polarity of the needle is best explained by supposing the earth itself to be a vast magnet. At the magnetic equator, as at the center of the bar magnet, the opposite polarities neutralize each other, and there are no magnetic phenomena. Hence at this line there is no dip. The chief seats of magnetic energy are two points which lie toward the geographical poles of the earth, and which are called its magnetic poles."

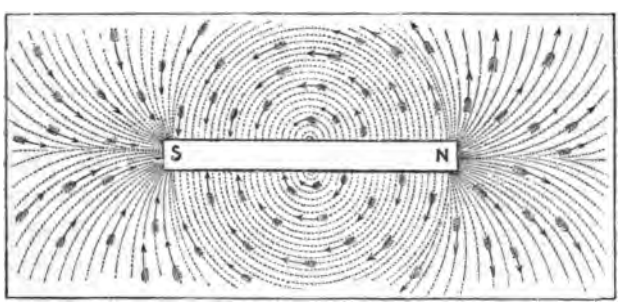

FIG. 4

THEORY OF ATTRACTION. — Figure 4 represents the magnetic principle of the earth. The familiar form of the bar magnet is used to represent the

central germ. The curves or circles which encircle it are magnetic currents, and seem to converge and diverge at the north and south poles. The arrows indicate the direction of those currents, which will be seen to be from the north or positive pole around to the south or negative pole, thence through the magnet and around in continuous currents, diverging at the positive and converging at the negative pole. The theory is briefly this: No body has within itself the property of attraction. True, it requires a certain elementary combination to form a visible instrument of attraction, just as a body of a given composition reflects a given color. But neither magnetism (attraction) nor color inheres in the composition or makeup of bodies. This theory of attraction is sustained by every experiment with the magnet and electricity. It is proven that two opposite poles attract and two similar poles repel, and that two currents of electricity passing through wires in the same direction attract, but if the currents pass in opposite directions they repel.* An apparatus known as the "phosphorus cup," among other experiments, proves that positive electricity always passes over to the negative when brought in proximity. In Fig. 4 it will be seen that all the magnetic currents pass from the positive point of the magnet to the negative in the same direction. The affinity of those currents form the aggregation of magnetism. *Attraction*, then, *is*

* See cuts and explanations, pages 57 and 58.

the aggregation of the affinity of magnetic currents, the center of the magnet being the common center. Hence Gravity is the sum of the aggregation of the earth's magnetic currents. The common magnet illustrates the principle, and the needle determines their direction. All points north of the earth's magnetic equator are negative, all south positive. At this equator gravity and magnetic intensity are least, increasing either way to the poles, where they are the greatest. The vibrations of the needle are the standard of the measurement of magnetic intensity; the vibrations of the pendulum and the weight of a body, the standard of the measurement of gravity. These are but different methods of measuring the capacity and intensity of the same Force. The magnetic construction of the needle is similar to that of the earth's magnetic germ, and falls in the line of direction of the magnetic currents. The pendulum or other body is not so constructed, and does not fall in the line of direction. The recorded measurement by the needle is the sum of the aggregation and direction of magnetic intensity. This must depend upon the degree of the dip of the currents in which the needle adjusts itself. The increase in the degree of the dip corresponds to the increase of approach to the (poles) points of convergence or divergence. The nearest approach is at 70 degrees north and south latitude, and the least is a circle of intermediate points equi-distant from the poles, where the dip is 0. The change in the dip, which is undoubt-

central germ. The curves or circles which encircle it are magnetic currents, and seem to converge and diverge at the north and south poles. The arrows indicate the direction of those currents, which will be seen to be from the north or positive pole around to the south or negative pole, thence through the magnet and around in continuous currents, diverging at the positive and converging at the negative pole. The theory is briefly this: No body has within itself the property of attraction. True, it requires a certain elementary combination to form a visible instrument of attraction, just as a body of a given composition reflects a given color. But neither magnetism (attraction) nor color inheres in the composition or makeup of bodies. This theory of attraction is sustained by every experiment with the magnet and electricity. It is proven that two opposite poles attract and two similar poles repel, and that two currents of electricity passing through wires in the same direction attract, but if the currents pass in opposite directions they repel.* An apparatus known as the "phosphorus cup," among other experiments, proves that positive electricity always passes over to the negative when brought in proximity. In Fig. 4 it will be seen that all the magnetic currents pass from the positive point of the magnet to the negative in the same direction. The affinity of those currents form the aggregation of magnetism. *Attraction*, then, *is*

* See cuts and explanations, pages 57 and 58.

the aggregation of the affinity of magnetic currents, the center of the magnet being the common center. Hence Gravity is the sum of the aggregation of the earth's magnetic currents. The common magnet illustrates the principle, and the needle determines their direction. All points north of the earth's magnetic equator are negative, all south positive. At this equator gravity and magnetic intensity are least, increasing either way to the poles, where they are the greatest. The vibrations of the needle are the standard of the measurement of magnetic intensity; the vibrations of the pendulum and the weight of a body, the standard of the measurement of gravity. These are but different methods of measuring the capacity and intensity of the same Force. The magnetic construction of the needle is similar to that of the earth's magnetic germ, and falls in the line of direction of the magnetic currents. The pendulum or other body is not so constructed, and does not fall in the line of direction. The recorded measurement by the needle is the sum of the aggregation and direction of magnetic intensity. This must depend upon the degree of the dip of the currents in which the needle adjusts itself. The increase in the degree of the dip corresponds to the increase of approach to the (poles) points of convergence or divergence. The nearest approach is at 70 degrees north and south latitude, and the least is a circle of intermediate points equi-distant from the poles, where the dip is 0. The change in the dip, which is undoubt-

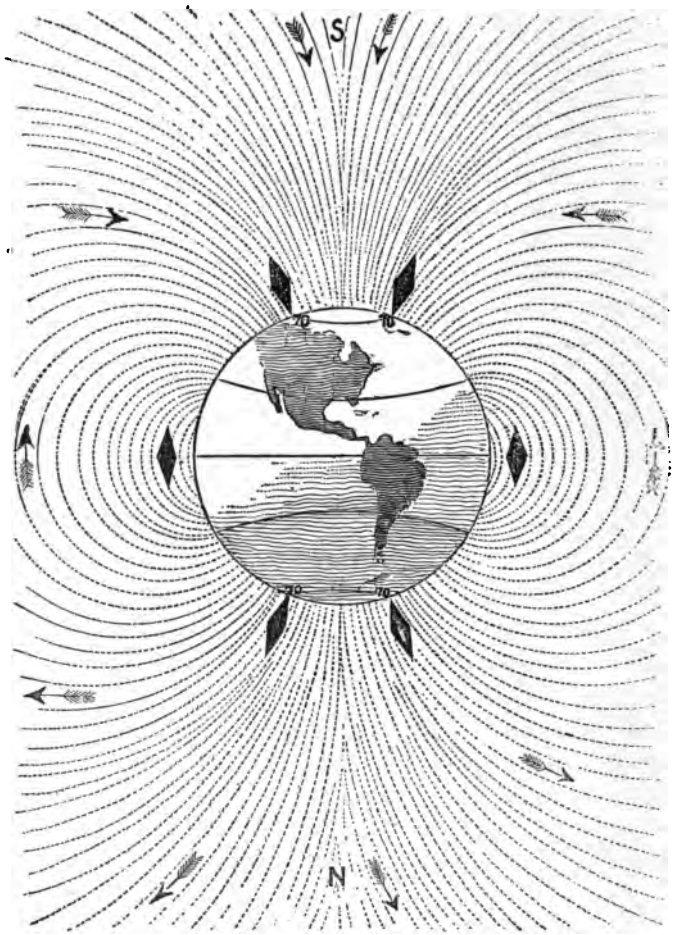

FIG. 5

edly due to solar influences on the earth, shows that the magnetic currents are lengthened or shortened, as the case may be, which correspondingly lengthens or shortens the distance in the line of direction of the currents to points of convergence or divergence. As these currents all span the magnetic equator, their lengthening or shortening could not alter the position of the needle at this point. But the dip or line of direction of the needle determines intensity (as marked by its vibrations) in the line of direction, as well as the degree of the affinity of the earth's magnetic currents. The vibrations of the pendulum must correspondingly increase or decrease in number, though in a less degree, as it only measures the *aggregation* and not the intensity of the magnetic currents. This is the only sense in which gravity differs from what is called "terrestrial magnetism," which may be said to be a distinction without a difference.

Now, each formation of the earth from the beginning increased the magnitude of the central magnet, though decreasing in density and intensity as the square of the distance from the center increased. That is to say, the magnetic currents continually adjusted themselves to the growing magnet, by extending their original curvature. When the formation of the earth was complete, the curvature of the currents was *relatively* the same as at first. In other words, the earth now represents a vast magnet, increasing in density and intensity as the distance towards the center increases. As represented in

Fig. 5, the magnetic currents span the magnetic equator, though by an arc proportionally extended. These currents, as shown in Fig. 5, represent gravity or "terrestrial magnetism."

Referring to Fig. 5, the reader will notice marks representing the comparative dip of the needle at the equator and 70 degrees north and south latitude. The figures represent the degrees of latitude. It will be seen that the currents of attraction span the equitorial line, where the latitude and dip of the needle are 0. Passing north and south from this line, the degrees of latitude and dip of the needle increase until 70 is reached, where the needle is vertical to the horizon.

To sum up, the correspondence between magnetic intensity, gravity and the dip of the needle are complete. Magnetic intensity, gravity and the dip of the needle are least at the magnetic equator, and greatest at the magnetic poles. And I maintain that with the change of the dip, magnetic intensity and gravity also change. They are the effect of the same Force, and must vary uniformally.*

*Our school philosophies teach that, "The force of gravity increases as the amount of matter increases." In the same connection it says: "A mass of lead that weighs 1,000 pounds at the poles, will weigh only 995 such pounds at the equator." We are taught that there are two causes that operate to produce this result. One is "the earth's Centrifugal Force;" the other, "that an object at the equator is farther from the center of the earth and less strongly attracted than at any other point." Notwithstanding the "law" that the force of gravity increases as the amount of matter increases." The increase of "matter" at the

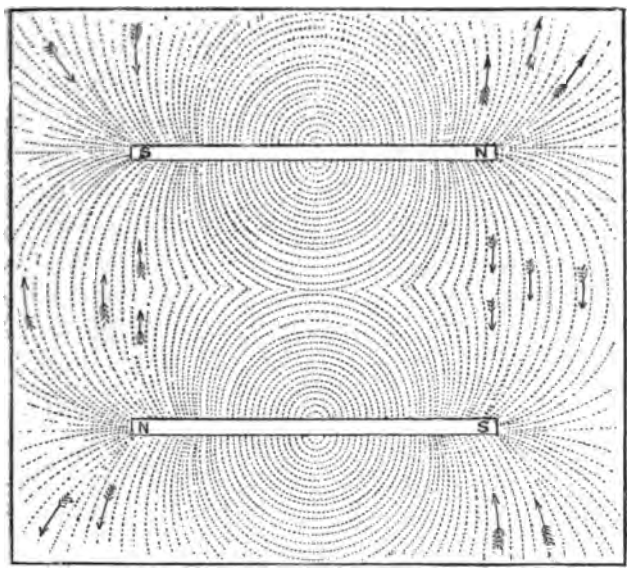

FIG. A

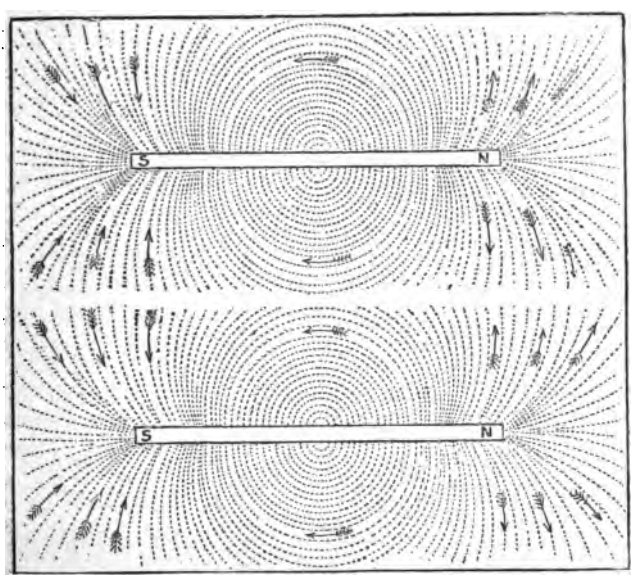

FIG. B

BASILAR PRINCIPLE OF MAGNETISM.—The accompanying Figs. A and B illustrate the principle of Magnetism. Each cut represents two magnets. In Fig. A the poles are reversed, and by following the course of the arrows with the eye it will be seen that the currents of one magnet *flow into the other*, in accordance with the principle of *attraction*, as explained on page 52. In Fig. B the poles are not reversed, and by following the direction of the arrows it will be seen that the currents meet, and in passing *from opposite directions* they repel. Hence the reason why "*unlike poles attract and like poles repel*," illustrating the great principle of action and reaction. The polarity of a magnet is determined by the direction in which the magnetic currents pass. The end of the magnet *from* which they pass is positive; the end *to* which they pass is negative. Fig. A represents the principle of the "astatic needle." The poles being reversed, the earth currents *cannot pass through* the needle, whose north and south poles are *like* the earth's north and south magnetic poles. Hence the poles of the astatic needle are said to be "neutralized." No matter which end of the astatic needle is turned *north* or *south* the result must be the same, action and reaction being equal, the repellant force of the

equator over that at the poles is twelve-and-a-quarter miles, and yet gravity is greatest at the poles and least at the equator! My explanation is that gravity and terrestrial magnetism being identical, the equator is what is called the "neutral point;" hence, attraction is least at the earth's magnetic equator, just as the attraction of a magnet is least at its center.

earth currents for the like pole of one needle is as great as the attractive force of the earth currents for the unlike pole of the other needle. By referring to Fig. 5, page 54, it will be seen that the earth's magnetic currents pass from south to north, but the currents of one (astatic) needle pass opposite in direction, no matter which end of the needle is turned north or south. As currents passing from opposite directions repel, so the earth currents and those of one or the other needle repel, which explains the phenomenon of the astatic needle.

I will now briefly revert to my theory of Evolution. What is called "the span of life" is, in fact, the circle of life. A man who "lives out the full measure of his allotted days" is a type of my theory. He passed the round of Decay, Birth, Growth and Death. The vital forces which first inspired and animated his being developed to the full extent of physical manhood. Change was continually at work. He passes on to the decline or weakening of his vital forces. He is in the "sear and yellow leaf." Finally those forces cease to act, which marks the end of the period of his life. The forces of his physical being made the last change that was possible, when the deserted tabernacle of clay sank back to dust from whence it came. It is a scientific fact that change, which is constantly going on, divided the grand period of his life into minor periods. His body underwent a complete change, by which every particle of its composition was renewed at the end of, say, a period of every seven years of his life. If,

for instance, he reached the age of 84 years, his body underwent twelve complete changes or minor evolutions. This was a process of renewal, not of his energies, but of their tabernacle. His energies reached their highest development at full maturity (summer), and from this point of the circle of his life, they decline, or turn in the direction of the point of beginning—ending in decay. Notwithstanding the continual process of the renewal of his body down to the very close, the energies flag and at last cease to act. Although his body had just been renewed (the twelfth time) his vital forces are exhausted, and decay sets his seal upon all that is earthly of this once animated and intelligent being.

So with all animate nature. A generation is the aggregation of individuals; and a Period the aggregation of generations. Whether plant or animal or the fire that burns—no matter what—all end at the point of beginning, and begin at the point of ending. Nothing but a circle represents the course of Change. Truly nothing moves in a "straight line."

FORCE

IN the abstract, there is nothing in existence but Force. The solid earth upon which we stand is a *latent* form, and constitutes *the substance of Force.* Oxygen, which enters more largely into its composition than any other element, has undergone the most rigid chemical test, resulting in the startling disclosure that it, or its essence, is, after all, only "an invisible Force." We are scientifically bound to accept this verdict as final. In this connection, however, I will revert to those only which were included in my original plan.

ACTIVE FORCE.—Active Force is that element of nature which produces all local phenomena. Examples: Inorganic elements of latent Force, attraction, heat, light, etc., etc.

There is a distinction in forms of Active Force, which I classify under the general heads of Force and Energy.

ENERGY.—Energy is that form of Force which produces all purely mechanical results. Examples: Animal Motion, Mechanical operations, etc.

NOTE.—The operations of force are simple; those of Energy, compound. Force acts in harmony with the principle of motion —circular; the impulse of Energy is always the same, but is often perverted by the counteraction of Force and other forms of Energy.

GRAVITY, OR TERRESTRIAL MAGNETISM.—These terms, which are synonymous, signify *Attraction*, and attraction is the aggregation of the affinity of magnetic currents, the center of the magnet being the common center. As applied to the earth, the office of attraction is to give to bodies on the earth's surface a fixedness of place and direction. Were it possible to suspend this force without nullifying Cohesion, no such catastrophe would be witnessed as is depicted by Newton and his followers. As a matter of fact, "things would weigh nothing," as is claimed, yet this does not argue that everything loose on the earth's surface "would be precipitated by Centrifugal Force in straight lines into eternity" (or words to that effect). On the contrary, if there were no other cause by which a body on the earth would remain unmoved (unless set in motion) Inertia alone would accomplish the result. "A body at rest will remain at rest" with relation to other objects about it, but with reference to *place* it has precisely the same motions as if it were firmly attached to the earth. If removed to a point say one foot or 100 feet from the earth's surface, it would

The principle of Force is fixed and unvarying in its operations, and the operation of all the different forms are identical. The principle of vibration is the same in all vibrating mediums; the principle of *intensity* is the same as applied to the operations of all the forms of Force, and the *density* of all bodies conforms to this principle; the principle of *reflection* is the same in all reflecting mediums; the principle of *pressure* is the same in all bodies that may be subjected to it; the principle of *life* is the same in all that live; and the principle of *death* the same in all that die.

still be relatively at rest, yet its motions would remain unchanged.

But it appears on further investigation that there would be no such thing as Momentum. How can we connect momentum (which is computed by the standard of Gravity) with an absolutely imponderable body? As momentum implies a *preponderance* of attraction, even planetary attraction practically denies its existence, save as a relative term. In an absolute sense, an equilibrium of attraction and the entire absence of attraction are the same in effect. If, without planetary attraction, a body on the earth would have no momentum, it could have none *with* planetary attraction. The same reasoning applies to the earth itself. With the equilibrium of planetary attraction, or, what amounts to precisely the same thing, the entire absence of such attraction, the earth has no momentum. As well to claim that a revolving magnet at the earth's center would have momentum as to maintain that a planet has, with or without planetary attraction. Neither would a revolving magnet at the earth's center have a "tendency to fly off in a tangent," or to throw from its surface anything attracted to it. For example, let us suppose that a magnetic globe, with an iron filing attracted to its surface, be placed in a vacuum and so suspended that it would rotate and revolve about a given center with great velocity. And let us suppose that, in connection with the attraction of the magnetic globe for the filing, attraction from and to every point were equal and uniform; would

the globe either have "a tendency to fly off in a tangent," or to throw the filing from its surface? If so, why? Suppose further, that all attraction but that of the magnetic globe were suddenly suspended, would the globe leave the path of its orbit, or the filing be thrown from its surface? If not, why?

These illustrations literally prove that, where "extremes meet," the conditions and immediate results of those extremes are equivalent. How, then, can we thread the theory of the earth's "Centrifugal Force" through these conflicting truths?

THE PHILOSOPHY OF SOUND, HEAT, LIGHT AND ELECTRICITY

EXPLANATION.—It will be necessary for the reader to study well the theory of magnetism and Terrestrial Magnetism before entering upon the study of these subjects. It will be seen by referring to Fig. 5, page 54, that the term earth currents, as used in this connection, signifies the magnetic currents of the earth. Fig. 1, page 9, illustrates the magnetic currents of the bar magnet, commonly called "magnetic curves." *Sound earth currents, Heat earth currents, Light earth currents and Electric earth currents* are terms used to distinguish the separate or distinct kinds of magnetic currents of the earth. (See Fig. 5.) The theory is that there are earth currents which, when caused to vibrate, produce the sensation of sound; others produce the sensation of heat; others light, etc., just as we

receive heat force, light force, chemical force, magnetic force, etc., from the sun.

MAGNETISM.—It will be seen by referring to Fig. 5 that the earth has about it an atmosphere of magnetic currents, the action of which draw everything toward the earth's center, or the center of magnetic attraction. This magnetic atmosphere is the earth's controlling force, subduing by absorption every other form. No matter how or in what form exerted, sooner or later every active agency loses its identity and becomes a part of this all-pervading Force. All around and through the earth this force is omnipresent and omnipotent. The principle of its operation is the principle of the operation of all. Two falling bodies, one weighing one pound, the other ten pounds, will travel with the same velocity and reach the earth at the same instant, just as the report of a musket and that of a cannon, the heat of a stove and that of a furnace, the light of a candle and the glare of the electric light, will reach any given point at the same instant. If resistance of the air must be taken into account in estimating the velocities of falling bodies, so also may resistance be taken into account in making various estimates on the velocities of sound, heat and light of various intensities. In short, whatever is true of the principle of terrestrial magnetism (gravity) is true of every form of force within its influence.

VIBRATION.—Magnetic currents, *when undisturbed*, are continuous; all other forms of force are vibra-

tory. Vibration is the tremor imparted to magnetic currents by force thrown off by friction, concussion, combustion, chemical change,* etc. If this tremor or vibration disturb the auditory nerve, the sensation of sound is produced; if the optic nerve, sight, and so on through the senses.

Sound. — Energy imparted to the bell-clapper causes it to strike the bell. Sound force is generated by the concussion, which produces a chemical change in the molecules of the *clapper, bell and the air at points of contact.* The origin of the sound is in the force thus generated. The cause is vibration; the effect must be vibratory. The sound force thus generated is communicated to the earth currents, and these vibrate in unison with the sound force. When the sound vibrations of the earth currents affect the auditory nerve, the sensation of sound is produced.

Molecular Motion.—When the magnetic currents of the earth are caused to vibrate, molecular vibration, within the range of such disturbance, must be the result. But molecular motion is the effect, and not the cause. Sound force is generated by chemical change, as has been stated, but sound force does not act on the surrounding molecules; it acts on the earth currents, causing them to vibrate in unison. The molecules, through which all these vibrating earth currents pass,

*Friction, concussion, combustion, etc., are forms of chemical change, differing from what is known as *chemical change* in quantity or volume.

vibrate in harmony with the overruling force. This is also proportionally true of heat and light.

The most conclusive proof of this sound theory is in the practical experiment with the telephone. The diaphragm of the receiving instrument may be removed and the sound still produced and transmitted to the ear. Here is an instance of sound without mechanical vibration. I know of no satisfactory explanation of this phenomenon outside of the theory here submitted. Stored sound force is transmitted through the wire conductor. When it reaches the receiving instrument it passes out through the currents of the bar magnet, setting them to vibrating in unison with the sound force first imparted, the sound earth currents receiving the vibratory shock which impart the unison tremor to the auditory nerve of the listener. I will just add that the earth currents spoken of and the currents of the bar magnet are identical in character.

HEAT.—Heat, like sound, has its origin in chemical change. In the case of combustion the chemical change generates heat force, which, vibrating against the heat earth currents causes them to vibrate in unison. When the vibrations of the heat earth currents affect the sense of feeling, the sensation of heat is produced.

STORED HEAT FORCE.—Place a bar of iron in the forge and it will become heated. Now remove it and it has the same temperature. The heat force

was communicated to the heat earth currents passing through the rod, which caused them to vibrate in unison with the heat force of the fire. Molecular motion in the rod follows, which, when they reach a given intensity of motion, bring the rod to a condition commonly termed hot. Remove the rod from the fire, the supply of heat force ceases, but the molecular vibrations continue until the stored heat force is drawn off by the conduction of the heat earth currents, which, in keeping with the principle of terrestrial magnetism, tend to restore an equilibrium, or "bring all things to rest."

LIGHT.—Light force is generated in the same manner as that of sound and heat, but when the light force strikes the light earth currents the optic nerve is affected by the friction produced, causing the sensation of sight. The vibrations of light force are inconceivable, yet the optic nerve detects the luminous effect as they strike the light earth currents. A ray of light is the path of light force sweeping the light earth currents. It may be said that the friction of the light force as it sweeps the light earth currents produces the phenomenon of light, just as the sweep of the hand across the cords of a stringed instrument produces sound.

ELECTRICITY. — Sound, heat, light and electric force has a common origin, but the operation of electric force is somewhat dissimilar. In producing a chemical change, the Latent Force ("matter") set free may be induced to follow a conducting wire, when it is called an "electric current." The fact

that its passage is not instantaneous is ample evidence that its operation is vibratory, and not continuous. What is called the magnetic property of electricity is due to the electric force striking the electric earth currents, causing them to vibrate in unison, forming a magnetic atmosphere about the wire or other body charged with electricity.

While there are sound earth currents, heat earth currents, light earth currents and electric earth currents, yet they all in the aggregate serve one common purpose, which is Terrestrial Magnetism, or what is commonly termed "gravity." This is why all things and all forms of force seem to possess the property of magnetism.

NOTE.—It must be borne in mind that while there are sound, heat, light and electric currents, *yet they are all magnetic in character.* In scientific investigations we should ever strive to lose sight of the mechanical, *the human*, for

> "In human works, though labored on with pain,
> A thousand movements scarce one purpose gain;
> In God's, one single can its end produce;
> Yet serve to second, too, some other use."

ENERGY

MACHINERY in motion, physical exertion, etc., represent the operations of Energy. Like Force, Energy acts from a given center. The impulse of Energy is circular. It would act in obedience to the underlying principle of motion if not prevented by conflicting or counteracting causes. Hence, the wheel is the most natural, and, therefore, economical mechanical instrument of Energy. A greater result can be accomplished, with less exertion and expenditure of Energy, and in less time, with the wheel than with any other mechanical power. The wheel is a continuous lever, which proves that the lever in operation describes the arc of a circle. It is as obvious, though not quite so apparent, that this is true of all the mechanical powers, since they all involve the principle of the lever.

A step further into the animal kingdom, including man, and we find the principle of the lever underlying all their varied and complicated movements. The proposition that the impulse of Energy is always circular is, therefore, well sustained.

1. The nearer a mechanical instrument of Energy conforms to the principle of motion in form and

construction, the greater the result, with a proportional decrease in the expenditure of Energy.

The wheel is the most perfect mechanical instrument of Energy. This is because it works in obedience to the impulse of Energy. Remove all friction and set it in motion, and it would revolve on forever. Perfectly formed and balanced on its axis, equalizes its "gravity." Its motion, therefore, would not be in opposition to that Force.

2. The impulse of stored Energy is circular.

Place a heavy wheel in rapid rotary motion and it will continue in motion after the instrument of Energy that set it in motion has been withdrawn. We see it revolving and would wonder why it continued its revolutions without a visible cause were it not a familiar occurrence. We investigate and find that it is impelled by stored Energy. The revolutions are circular, which is the expression of the impulse of the stored Energy. Now, the wheel being the most perfect mechanical instrument of Energy, it follows that the revolving wheel is the most perfect expression of the impulse of Energy; or, in other words, the most perfect expression of the principle of motion, as applied to the mechanical appliances of Energy.

3. The escape of Energy is at points of contact with Force or other forms of Energy.

At the axis of a revolving wheel there is a given amount of Energy arrested by friction. The remainder passes on, charging every atom of the

wheel, from center to circumference. The friction of the air against the surface of the circumference resists the motion of the wheel and must be overcome. To accomplish this, a portion of the Energy passes out and drives the air away. This would create a vacuum between the points of the wheel's contact with the air, but for the air rushing in from opposite points (all points along either side of the wheel to the center,) to fill the vacuum thus created. This process is kept up continuously, increasing in activity with the increase of the wheel's velocity. The air draught being in every direction from the center to the circumference, the axis is the point of convergence and divergence. This would produce a pressure at that point (or points), exactly in proportion to the quantity of air driven away from the points of contact, and this would depend upon the area of surface of the wheel's circumference, and its velocity.

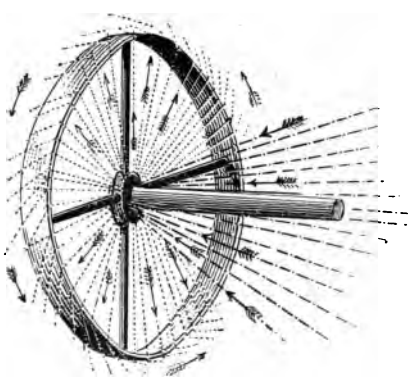

FIG. 6

The same general explanation holds good in fig. 7 which represents an apparatus that is much used in schools and colleges. The apparatus is made of a perpendicular iron bar, over which is placed two thin flexible metal hoops at right angles to each other, and fastened at B but loose at A. When the hoops are given a rapid rotary motion around the rod they will assume an oval form, sliding down the rod at A proportionately.

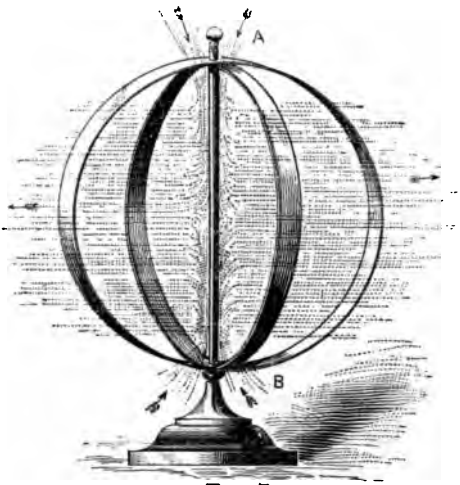

FIG. 7

EXPLANATION.—The rapid rotary motion of the hoops practically multiplies their number by reason of their continuous change of place. In this, as in Fig. 6, Energy acts from the center to the circumference. The points of contact of the hoops with the air are the area of their outside surface. Now, it will be seen that if the hoops rotated slowly, the air, thrown off from the surface of one hoop, would rush back in advance of the next following, and so on. But when rapid rotary motion is given them, their change of place is so nearly

simultaneous that a continual expulsion of air from their outer surfaces creates a draught from all points along the rod (center) to the hoops, through which it rushes to replace the air thrown off from the hoops. The points of convergence of the draught of air are at A and B (axis). It will be seen that the inflation of the hoops at their greatest circumference, and their corresponding flattening at A,† is caused by the current of air rushing in at A (and B also), and out through the hoops to take the place of the air expelled from their surface by the Energy which gives it its rotary motion.

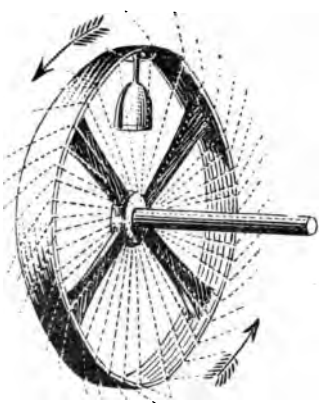

FIG. 8*

*Fig 8 represents a wheel with a broad rim or felly, on the inside of which is placed a wineglass partly filled with water. Rapid rotary motion given to the wheel will cause the glass to keep its place and the water to remain in it. This is caused by the draught of air outward from the axis, produced by the continuously forming vacuum at the surface of the brim or felly. The small arrows and dotted lines in Fig. 8 show the direction of air draught.

†A sphere of moist clay revolved rapidly on a potter's wheel will bulge at the equator and flatten at the poles. In this case the draught of air is from the poles *over the surface* of the sphere toward the equator to replace the air expelled from points of the sphere's contact with the air. This axis (poles) are points of

A train of cars passing around a curve describes the arc of a circle. Its "tendency to fly the track" is caused by an immense volume of air pressing against the train from a point that would be the center of a circle of which the curve of the track is the arc. This pressure is caused by the air endeavoring to pass through the train to replace the air expelled from the opposite side, which represents the greatest circumference. To overcome this pressure of air, the outer rail around the curve is slightly raised above the inner one.

So-called "Centrifugal and Centripetal Force" are terms designed to be opposite in meaning. A leaden ball whirled about the head at the end of a cord represents the supposed operation of these so-called forces.

EXPLANATION.—A body passing rapidly through the air has the continuous effect of producing a vacuum in the rear. But the air is as continuously drawn around the body by the force of the continuously forming vacuum, from the points of contact, which operates as a resisting force. The effect of the air closing around a moving body may be heard in the rolling thunder, the roaring meteor, the whistling bullet, etc. This proves that the friction of the air on the surface of a moving body

convergence of the air draught, and where the pressure of the air is exerted, and the points of contact are where energy expells the air from the surface of the sphere, which, taken together, causes the phenomenon of what is erroneously attributed to "Centrifugal Force."

as it is drawn around by the force of the continuously forming vacuum is very great. In the case of the leaden ball whirled about the head, there is practically a multiplication of the number of balls, by reason of its almost continuous change of place. This explains that there is a continuous current of air outward from the center of the circle described by the rotating ball. Break the cord, and the action and counteraction of Force and Energy will cause the ball to follow the path of the least resistance.

FIG. 9

ANALYSIS.—1. The motive Energy communicated to the ball; 2. Counteracted by the resisting air (Force); 3. Upward impulse of Energy; 4. Counteracted by the Force of gravity; 5. Energy exerted in holding the cord; 6. Counteracted by the Force of the draught of air outward from the central points of the circle.

We see, then, that action and reaction are diametrically opposite in line of direction. (See Fig. 9

for illustration.) It will be seen at a glance that the counteracting forces will not allow the ball to continue in its orbit after the cord is broken. Energy will not succumb to resisting Force, which leaves but one escape for the liberated ball, and that is, *to follow the path of the least resistance.* Those six forms of Energy and Force act on the principle of the lever geometrically applied. The whirling ball represents an invisible sextuple lever, operating upon an invisible fulcrum that is continuously changing its place. Dispossessed of gravity, the ball could not be whirled about the head. Exhaust the air and the effort to impart motion to the ball through the cord would result in simply drawing the ball to the center. Remove both the resistance of the air and gravity, and "the straight line tendency" of the whirling ball would fail to appear —it would continue to move in a circle forever, "unless acted on by some external force."

4. Hence, Energy always seeks the path of the least resistance.

Our Natural Philosophies tell us that "a body in motion moves in a straight line with uniform velocity, unless acted on by some external force." —*Newton's First Law of Motion.*

It seems that it did not occur to the author of the above "law," that a body in motion moves in a straight line *because acted on* by some external force. And this "law" is made to apply universally as a principle of motion!

All mechanical motion is the result of the action of energy. In its operations it cannot escape the resisting influence of Force.

Gravity and the resisting air are everywhere in operation, and these resist, restrain, and finally conquer all energy. It matters not when or how energy is exerted, it must sooner or later surrender to these Forces. They mark the "straight line" path of the body "flying off in a tangent;" or the projectile, as surely as the motions of the earth mark the divisions of time. The wheel that rotates from a fixed point is at their mercy. They rob it of the Energy imparted to it, and bring it to rest. In doing this gravity causes the points of rest to wear away by friction, and the air acts as a brake at every point of the circumference, keeping up a continuous conflict with Energy for the supremacy. In this conflict everything not firmly attached to the wheel at the point of contact will be thrown off in the path of the least resistance, which is the arc of a greater circle. There is no mechanical effect but has an *immediate* cause. The simplest and most familiar occurrence admits of a scientific explanation. Why water is thrown in "straight lines" from the circumference of a grindstone is, of itself, a scientific problem; and to lay down the evasive and unsatisfactory explanation, that "the water tends to fly off in tangents," is unscientific. But to apply this explanation to the absurd supposition that "things tend to fly off in tangents" from the earth's

surface at the equator, is one of the most discreditable blunders of all accepted science.

CAUTION.—By referring to Fig. 7 and accompanying explanations, the action of Energy from center to circumference will be understood. But it must be borne in mind that it is *the Energy imparted to the hoops* that drives the air from their greatest circumference (points of contact). In other words, divested of Energy the hoops are absolutely inert. Now in applying this principle to the rapid rotary motion of the glass-globe top filled with mercury, water and air, it will be readily seen that the Energy imparted to, and stored in the top, acts internally as it does externally—in every direction from the center, the greater proportion passing down to the point of greatest resistance (point of rest), which is the point of the spindle with the floor. This downward force of Energy and consequent intensely vibratory action, overcomes the specific gravity of the mercury, and it passes upward and outward to the equatorial points of the top. The water is forced to take a similar position, which, tending to create a vacuum in the bottom by reason of the ascending mercury and water, causes a downward pressure of air toward that point. The mercury and water cannot raise to the center because Energy is constantly acting from that point, hence its equatorial adjustment.

CONCLUDING REMARKS

VAGUE and indefinite is the theory of accepted science in unfolding the organic principle of the earth. It leads us to the absurd supposition that the sun is a magnificent workshop, in whose molten labyrinths worlds are, from time to time, fashioned and thrown off into space in a molten condition, and that, by the "Centripetal Force" of the sun, gradually overcoming the "Centrifugal Force" of the planets, they are drawn around in a curve, and finally into the path of their respective orbits.

We are led to the conclusion that, in the beginning, the earth took her place and began her regular motions in her orbit, notwithstanding the conflicting statement that the equilibrium of planetary attraction must be complete. If the elements of which the earth is composed were once at the sun or some other distant point, what interposed to maintain the equilibrium when they were placed in their present orbit?

The "molten mass" theory of the incipient state of the earth originated in the discovery of almost universal evidences of the effects of intense heat. The theory, like most others of a kindred character,

has a purely mechanical makeup. The earth, bearing unmistakable evidences of violent outbursts of "molten matter," gave rise to the supposition that such phenomena must have had a mechanical origin. It involved extreme embarrassment in the explanation of where and in what condition the waters of the earth existed during the "molten mass" period, and as to what became of the internal heat of the molten interior of the earth during the Glacial era, etc. But, as usual, to prove a bare possibility (and not even that in this case), mathematics were resorted to, resulting in explanations as unsatisfactory as they are intricate. So the theory of the origin of the earth has not kept pace with its development, but remains to be evolved out of the chaos of absurdities by the force of reason.

Probably the most inexcusable error of physical science is the "straight line" theory of motion. In the face of the universe of circular motion, in which none but such bodies as are under the direct influence of gravity and the resistance of the air, move in any other than circular paths, the theory is maintained and taught in our schools and colleges, that "a body put in motion will move in a straight line unless acted on by some external force." In other words the straight line is the natural path of all motion. Hence we are told that the "tendency" of planets and suns is to leave their orbits and move in straight lines. The scientific (?) definition of "tendency" is "Centrifugal Force." Accepted science would have us believe that this supposed

force inheres in every moving body. As has been stated, the origin of this theory of motion was in the observation of moving bodies influenced by gravity and the resisting air. Thus the "First Law of Motion" was adduced from purely local conditions, and has, therefore no general application whatever. Even in a local sense, the "law of motion" is incorrect, as is shown in previous explanations.

In the light of so much evidence, I cannot understand why the theory that the natural impulse of all motion is circular, and unless prevented by some counteracting force, *all things* in the universe would move in circles, has not been introduced and adopted. The discovery must always precede the introduction, however, and had this discovery been made, it would have opened up to the discoverer the great principle of evolution as applied in this treatise. The circle is the typical form of the universe. The form and motions of planets and suns describe it, and mark all the natural divisions of time, which evolve Change, and Change in its fullness, marks Evolution. Thus Form, Time, Change and Evolution are inseparably connected. Form and motion describe circles, and are the prototype of Time, Change and Evolution. As the *form* must comprehend the *substance*, so the sense in which the terms are here used makes them synonymous. From these premises, what shall we say of "the law of motion?" How does the "straight line" theory harmonize with the foregoing principle? And how does the

scientific supposition, that the earth was formed and "set in motion," coincide with the great truth that Form (substance), Motion, Time, Change and Evolution are inseparably connected? If the earth had a beginning of motion it had also a beginning of Form (substance), and this contradicts the statement that substance ("matter"), is without beginning or end. The truth is, one cannot exist without the other. Form (substance) and motion are inseparable, and are without beginning or end. Change in the construction of the earth is *perpetually* going on, while its form and motion are as unending as the elements of which the earth itself is composed.

From our environments, circumscribed as they are by the limit of the sweep of our imperfect vision, we look out into the broad expanse above us and imagine that the conditions of our little fourth-rate world are a "law" unto all the rest. Cumbered by gravity and wading about at the bottom of a great sea of air, we find it difficult to divorce our minds from the impressions of our sordid senses, which would make us believe that these conditions are universal. Newton saw the apple fall from the tree, which gave rise to the theory of planetary attraction. He proved that a body revolving rapidly through the air "tends to fly off in a tangent," and therefore, the earth, in its revolutions around the sun, "tends" to do the same thing. From these two points he made laborious calculations on the possibility of attraction

existing between the earth and moon, and found that it is possible. He found, further, that it is possible for attraction to exist between the earth and sun. Applying the discovery, that a body rapidly revolved through the air ' tends to fly off in a tangent," caused by what is termed "Centrifugal Force," to his calculations, he inferred that the "tendency of the earth to fly off in a tangent from her orbit" is exactly counteracted by the sun's attraction or what is called "Centripetal Force," and the balance of power held by other planets and suns. The theory rests mainly upon "Centrifugal and Centripetal Forces," which are familiarly illustrated by whirling a leaden ball, attached to a cord, rapidly about the head.

It was also discovered that a body in rapid rotation "tends" to throw things in tangents from its greatest circumference. From this it was decided that the earth "tends" to do the same thing, and that, if its rotary motion were increased 17 times, everything loose, at or near the equator would be precipitated "in straight lines" into eternity! From this, and the theory that the earth was, in the beginning, "a molten mass," it was assumed that, in the cooling-off process, it "bulged at the equator and flattened at the Poles."

Now let us see what all this amounts to. The whole scheme rests upon assumptions. It is assumed that gravity reaches far out into space, and the assumption is sustained by a series of laborious calculations based upon the "law" of attraction.

viz.: As the square of the distance increases, attraction decreases. The calculations prove the bare possibility from the data, and it would appear, therefore, that the theory of planetary attraction were clearly demonstrated. Notwithstanding all the splendid calculations that have been made,* the fact remains that the proof lacks the corroboration of reason. Gravity *may* and *may not* reach out into space. No practical test has been, or can be made. Allowing that it does, the fact that it effects or is effected by the sun and other planets still lacks demonstration. Planets are all negative bodies, and, hence, it were more philosophical to conclude that they repel, rather than attract, each other. The sun being a positive body does not argue that, therefore, the earth and sun mutually attract each other. It may be that they are positive and negative in a generative sense only. Besides, it is not known that, if even gravity reaches out into space, the diversity of elements and conditions of the sun and other planets are not such as would

*The seeming perturbation of planets may be explained by supposing the observer to be viewing them through irregular and unequal densities of atmospheric strata. As the position of objects on the earth seem to be removed from their actual location when viewed through mirage, so a planet, viewed through a series of abnormal and irregular densities of air—not as in a mirage, confined to a small portion of two or three strata, but sweeping through the entire range of the atmosphere (which may be 500, 1,000 or 2,000 miles in thickness)—would seem to be temporarily diverted from the path of its orbit during the passage of such a series of irregular strata between the planet and the eye of the observer.

completely nullify that Force in space, or by correlation, transform it into other forms of Force more useful in their effects.

Locally, gravity (terrestrial magnetism) is a known quantity; universally, it is an unknown quantity. Where the conditions are known to be equal or the same, unknown quantities may be accurately determined from the known. In the measurement of angles and distances, this is true, as the conditions (places) of these are all fixed and unvarying. From rules adduced by the demonstration of the comparative size and distances of objects about us, the *approximate* size of planets and their distances from us may be reached. Even in this case, however, the difference in the density of the atmosphere at different altitudes, and the refraction of light incident thereto, precludes the possibility of absolute demonstration. To insure absolute correctness, mathematical calculations must rest upon authentic and well-defined data. In calculating on the extent of the earth's magnetic atmosphere, gravity should be *known* to extend beyond the limit of the atmosphere. For aught we know, the continuous and perpetual operation of the earth's magnetism may be dependent upon the recuperating influence of the sun's magnetic rays. For it is certain that the atmosphere is one medium by which solar heat and light are developed. May not this be also true of terrestrial magnetism (gravity)? Or, in other words, does the earth's attraction depend upon the continuous vibratory

action of the magnetic rays of the sun on the atmosphere ?—or, say, on the whole earth ?

These criticisms may be denounced as merely speculative, based upon far-fetched premises. If this be true, it is equally true of the theory of which it is a criticism. True, gravity exists as a local condition, but there are plausible reasons why this condition is not universal in its operations and effects. The most prominent among these reasons I have not yet alluded to, but will now take occasion to do so.

Planetary attraction (or universal attraction) could not exist as a necessity. So far as human perception and reason have reached, everything has been discovered to perform some *essential* function in the physical system of the universe. Nothing exists that is absolutely useless. Now it appears from the clear and unmistakable refutation of the theory of the existence of "Centrifugal Force," *as a Force* (see explanations under "Energy"), that the earth has, in fact, no "tendency to fly off in a tangent" from the path of its orbit, and hence, the existence of so-called "Centripetal Force" is clearly obsolete. In short, if there is no such thing as "Centrifugal Force," there is certainly no "Centripetal Force," and if neither exists, the necessity for planetary attraction does not, therefore, exist. "Matter" (Latent Force), being absolutely imponderable, does not require the counter-support of planetary attraction, and hence, we find the evidence conclusively against its existence.

I will not consume further time and space in presenting other reasons than those I have already given. The argument is at an end, and I leave the reader to draw his own conclusions therefrom.

Leading on to the investigation of Active Force, we find its operations coincide with the typical form of the universe—the circle. We have just stepped out of eternity into the lap of time—from the inspection of planets and suns into the realm of Force where all local phenomena are produced. Here I find Force acting in perfect accord with the underlying principle of motion. There are no reverse motions in the machinery of the universe. The planets, carrying everything with them, rotate upon their axes, revolve around the central suns, and these suns around other greater centers. Their motions are *the type*, and not the exhibition of Force. They are all absolutely imponderable bodies, have no resistance to overcome, and hence, require no propelling or restraining force. It is only within the regions of the atmosphere that active Force is generated and here its operations arise from the principle that inheres in it, which discloses the purpose in keeping with the necessities of conditions. "Like effect, like cause." In form, the operations of active Force must be typical of its source. The configurations of terrestrial magnetism (gravity) must correspond with the outline and motions of the earth—circular. "Like begets like." The vibrations of sound, heat, light, etc.,

describe the same general outline, all moving in the grand march of Time and Change.

Another step and we find ourselves under the dominion of Force. Here we find Energy struggling against the Force of gravity and the resisting air. Fettered as it is, it still retains the native impulse, and would give to every mechanical instrument a circular form and motion. Instinctively men have taken advantage of this and, where it is possible, have substituted the wheel for all other mechanical forms. Notwithstanding "the law of motion," that "the tendency of a moving body is in a straight line," men who sanction this "law" employ circular instruments of Energy where it is possible to do so. True, there are apparent evidences of straight line motion, but in every case it is the result of the complex operations of Force and Energy, which is fully explained elsewhere. In the motion of the animal kingdom the circular impulse is noticeable. The principle of the lever is involved in all their complicated movements, and, as has already been stated the wheel is an endless lever. Swarms of birds and insects describe the circle. A swarm of bees in transit describe an oblong spheriod in regular and rapid rotation. In the center of this insect globe may be found the queen bee directing the swarming host.—It is a standing wonder that one who has lost his way in the darkness or a dense fog will wander about in a circle. He simply acts in obedience to the impulse of Energy.—Those who have held to the theory

that the invention of perpetual motion is possible, had evidently caught the inspiration from the grand principle of motion, which is itself perpetual. Gravity and the resistance of the air defeated, and will defeat, every attempt at such invention.

But enough. Here I leave the reader with the key to sound investigation. I have "blazed the way" where the route was trackless, and you will find my footprints pressing hard against the errors of Time. You will find little difficulty in following me, as I have been led by the highest dictates of reason. I have found no intricate problems to solve in reaching the truth. The universe is all simple and harmonious in its operations. There is but one theory that threads through all phenomena, and that theory is the reflex of that which it unfolds.* A casual glance through the work will reveal the system of that theory and its correspondence to known principles of the universe. No effort has been made to unfold the fundamental principles of Evolution, yet they are unfolded, and it may be suggested that "The Principles of Evolution" is a more appropriate title than the one given to this treatise. Starting out on the proposition that, as there is no such thing as rest, all things in the universe move, and, that motion is uniformally

*My greatest effort has been to simplify and not mystify the principles which I have endeavored to unfold. If I have succeeded, the treatise possesses a merit that can rarely be accorded to scientific works, viz: that of being intelligible to a large and intelligent class of readers outside the small circle of scientists.

circular, the theory threads through the grand evolution of worlds on this principle, and minor evolutions of Change throughout the realms of Nature. The principle of all motion, whether of visible or invisible forms, is circular. The type of Change or Evolution is a circle. This is not a baseless theory, but it is founded on known principles and conditions. I am aware that the system I have briefly outlined may be vastly elaborated, and I trust that it may be my good fortune to do so in a future edition.

I have avoided the useless and extravagant discussion of things that must forever elude the grasp of mortal mind. Hence, I have no theory respecting the entity of things. Yet I have ventured to deny the existence of dead "matter," for obvious reasons. The implied *weight* of a dead substance is not in harmony with the illimitable, which neither supports nor is supported. I cannot associate absolute imponderableness with a dead entity, even though it were enlivened by Force. To say that "matter" is sustained by attraction, leaves both attraction and the theory without a support.

In vain has the chemist searched for one atom of the solid body of the universe. The most rigid and critical analysis has failed to disrobe the "dead entity" of its quickening Force. Reduced to a point so minute that the microscope cannot detect it, its presence is still realized by the Force it exerts. It was "dead matter" at the beginning of the chemical test; now "it is instinct with life!" Then it was

inert—lifeless; now it is "an invisible Force." Shall we still maintain that it is dead? Or shall we take the evidence that it—that invisible entity—is Force, and that it simply changed its *form?* All the evidence that can be gathered from the archives of chemistry sustains the proposition that, what is called "matter" is, in reality, *the substance of Force*, and that, by chemical analysis, it undergoes transformation. It is this element of Force that makes life possible. By the sun's chemical rays, it is liberated from the grasp of Cohesion, and becomes the builder and quickening spirit of all animate nature. Its vibrations, give to the volcanic flame its frightful glare; dance upon the sunbeam and light up the hearthstone at eventide. Or, it may be the messenger of thought that flashes through the wires and illuminates the intellectual world. To-day it may be "the lifeless clod;" to-morrow the tender plant. Again we may see it in the feature, the eye or in the very expression of beauty.

No, there is nothing dead in the universe. All that *is* is Force—Activity—Intelligence—Purpose. Force, in all its forms, is the instrument of the All-wise and designing purpose. The method of its use is Evolution. The hosts of co-workers are marshaled in the order of infinity—circles, and by their mutual interchange, following the line of march, they evolve all phenomena. Starting from the bondage of Cohesion, it may only pass through the inorganic forms of Heat, Light, Electricity; or it may pass through the organic or animate forms—

and return. Thus in ceaseless round the work goes on, ending in a series of changes here, and merging into another there. The life of an insect, man or planet is rounded up into a period, differing in duration as the forms of Force and changes in each differ in number from the other. But at the end, which is at the point of beginning, each and all must submit to the decree of Change, and follow on in the grand march of Evolution.

I do not profess to hold the key to mystery. No theory respecting the composition of Light, Heat, Electricity, Magnetism, etc., is advanced in this treatise. As these are all forms of Force, and as a knowledge of the composition or entity of Force is hidden in impenetrable mystery from the human mind, so all scientific inquiry must come to an end when we reach this point. We must be content with knowing that Force *is*, and *how* it acts, and relegate *what it is* to the caprice of visionary minds, such, for instance, as would invent perpetual motion.

I have made no effort to deal with the illimitable. Principle is substituted for "law," because law implies the necessity of execution, while principle signifies continuous and perpetual execution. Principle represents the operations of MIND. At least the unlimited evidences of an intelligent Purpose presupposes the continuous and unlimited operations of Mind. This is the only intelligent conclusion that can be reached from the premises.

And now I leave the great truths contained in this little volume with the manhood and intelligence

of this age of enlightenment. It will find opponents among those whose opinions are forecast by standard authorities, and who are loth to admit the possibility of further advancement. But I am persuaded to believe, by the spirit of honest and unselfish investigation that now characterizes all scientific research, that the result of my labors will be kindly received, and fairly dealt with, by representative men. I neither challenge criticism nor beg its leniency. I drop this "handful of spiritual germs on the hard, smooth highways of humanity," realizing that "they are seeds from God's granary, and that the snow and sleet of a thousand centuries cannot freeze them out." I dare not hope that the grand system of universal science, as outlined by this brief treatise, is absolutely faultless. Were this true, I would stand solitary and alone in the field of discovery.

The journey through the almost trackless realm of the universe was beset with the usual difficulties that are encountered by the scientific explorer. The route has been crossed and re-crossed by the learned and great, and I saw where the mathematician had strewn his figures along the pathway of the planets and sun, demonstrating, from false data, "the great law of planetary attraction." But I pressed onward, with an unselfish devotion for truth, pausing only for a moment here and there to make sure that I was not following some misleading theory. But I adhered strictly to the directions of my guide, whose very greatness consists in his magnificent simplicity and the grandeur of his

unselfishness. That guide is the *Eternal Purpose* which threads through all phenomena. I caught the course of his ceaseless round, the endless system of progression—moving on and on in perfect harmony to eternal destiny. How well I have followed the teachings of this mighty spirit, the crucial test of criticism will finally reveal. I have the faith of the martyr in the power of Truth, and its ultimate triumph, though left to grapple alone against the glittering sophistries of all the learned hosts of error. Truth is the expression of reality —of that which *is*—and must be as enduring as its prototype. I have no fellowship with error, and if it has insinuated itself in this treatise where it has escaped detection, I trust that it may not elude the searching eye of criticism. Let the Truth stand, but error fall!

THE END.

SUMMARY

The Circle is the typical form of the universe.

All motion, whether of visible or invisible forms, when uninterrupted, is circular.

The planetary systems are absolutely imponderable and in their motions, meet with no resistance; hence, their motions are circular.

The principle of motion, as applied to the heavenly bodies, reveals an illimitable and perpetual system; is co-existent with, and inseparable from, them, no matter what their state, or condition of development.

This is self-evident, as *there is no such thing as absolute rest.*

From these axiomatic premises it appears that the circle is the lineal form of all the heavenly bodies, marks their motions and pathsway, which evolve all the natural divisions of Time and fixes the course of Change.

The principle of Change is Evolution, and evolution is the universal system of development marked by Decay, Birth, Growth and Death, measured by the natural divisions of Time which, in turn, are the product of Form and Motion.

The *euphony* or harmony of the universal system of development is Correspondence (typical relationship) and Blending.

Magnetism—Terrestrial Magnetism (Gravity), is the aggregation of magnetic currents, the center of the magnet being the common center. The currents diverge at the positive, and converge at the negative pole, all passing in longitudinal circles through the center, or magnetic equator. Their aggregate force is *Attraction.*

Force is either Latent (" matter "), or Active. Active Force is a chemical product evolved by the generative process of solar and planetary action.

It follows as a logical sequence that the operations of Active Force must conform to the underlying principle, namely: Circular form and motion, since from these are evolved all the natural divisions of Time which, in turn, fix the course of Change. Hence, the operations of Active Force are circular.

Energy is a secondary form of Force, being a mechanical manifestation, and under the dominion of Active Force. The tendency or impulse of Energy is always circular.

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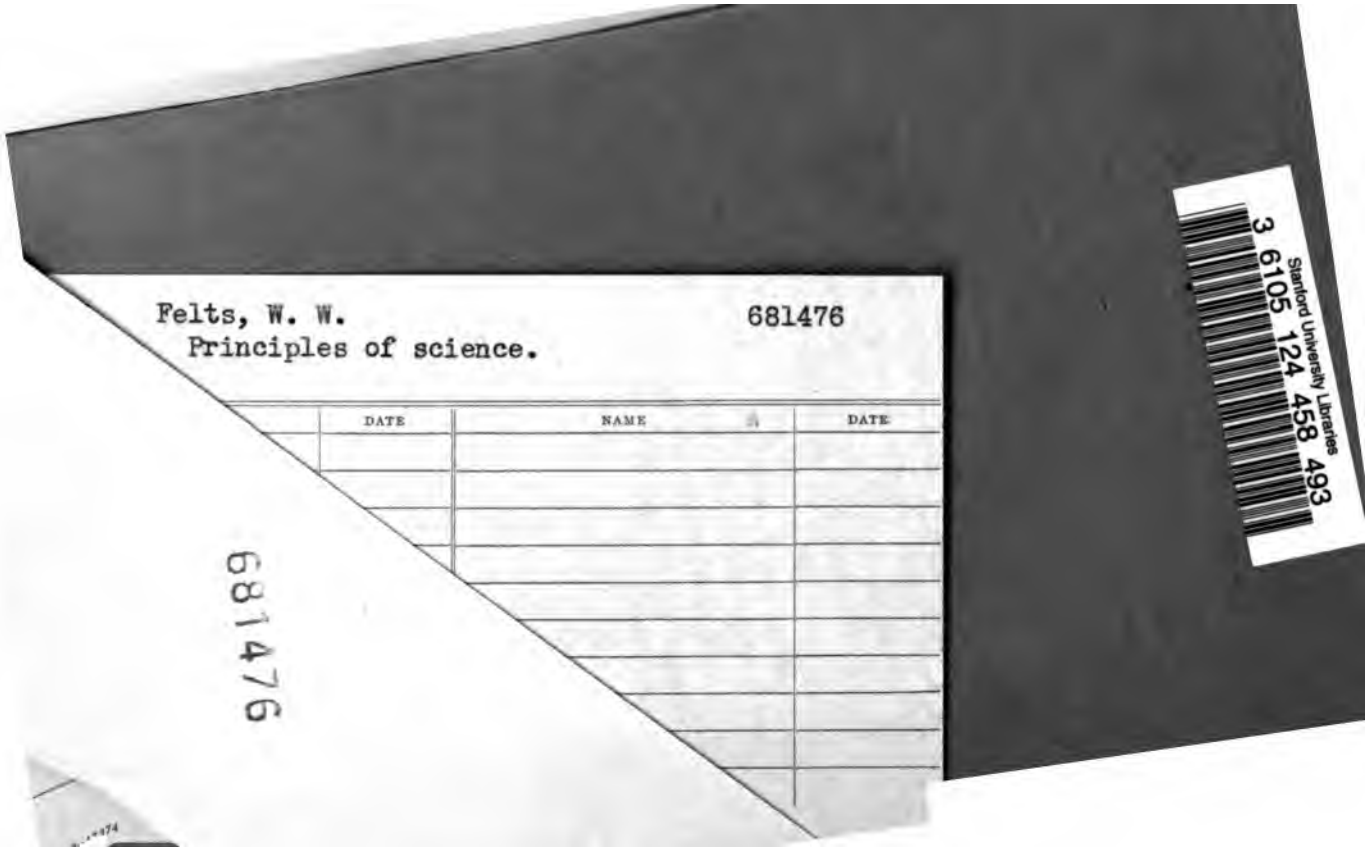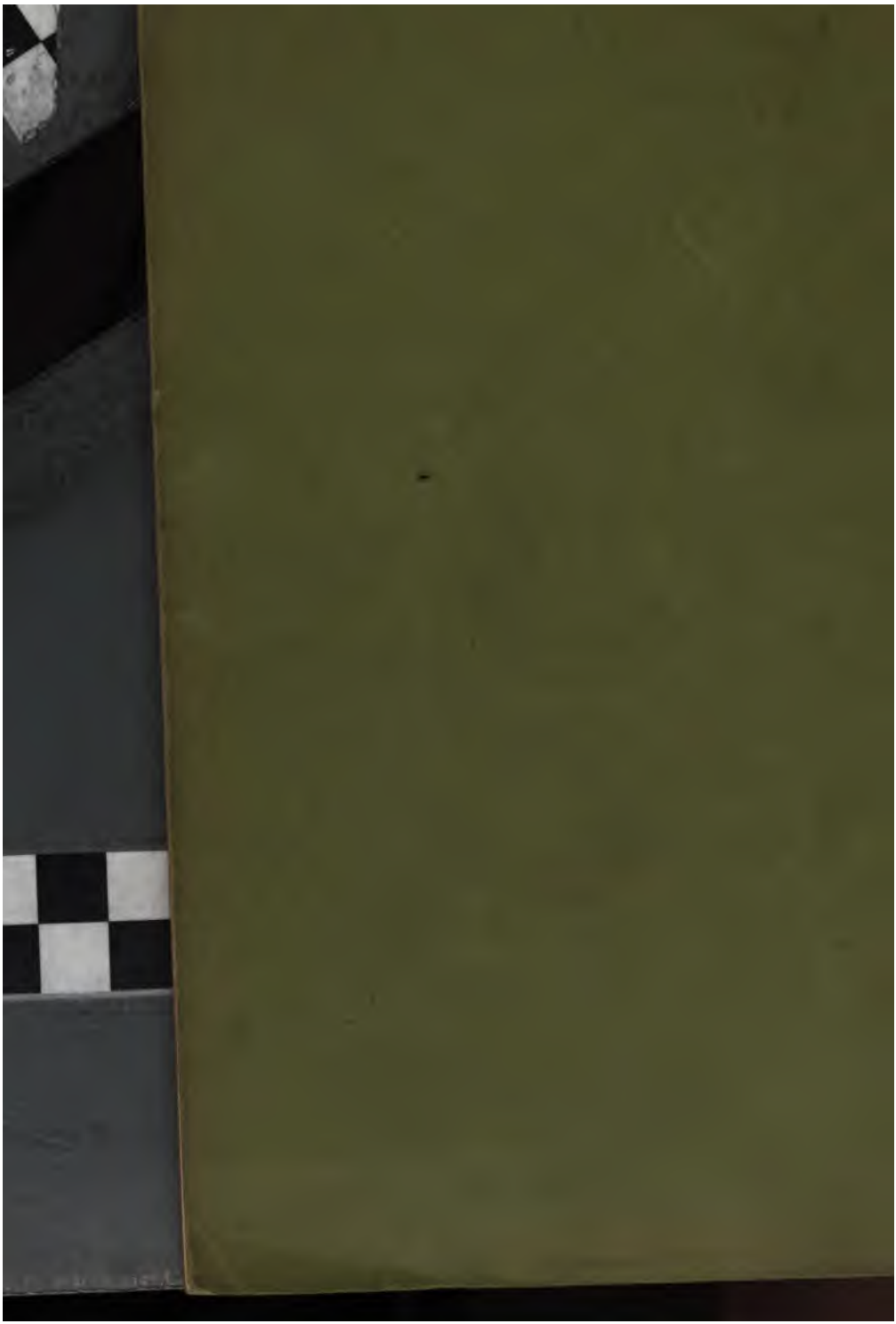
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